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VETERINARY MEDICINE

December 1934

CONTENTS

Red Cross Reaches Into Millions of Homes 498
Federal Meat Inspection 498
Bovine Tuberculosis Eradication 499
Better Veterinary Conventions 500
Vitamin D Milk 501
Neoplasms of Captive Wild Animals 502
Urine Examination in Diagnosis 504
Chicago Medical Libraries 506
Useful Capsules 510
A Quart of Milk Daily 511
Metallic Poisoning in Domestic Animals 512
The Stomach Tube as a Catheter 513
Veterinary Dental Anesthesia 514
Factors Causing Dystocia 516
Rickets—Historical 517
Diseased Animals a Hazard for Man 517
Rupture of the Bladder 518
Do You Remember? 520
Surgical Treatment of Fistulous Withers 521
The Prevalence of True Sweeny 522
Team Pulling Contests 523
Improved Horse Breeding 523
Garbage Poisoning in Swine 523
The Viability of Streptococci of Mastitis 524
Plague of the Middle Ages 526
Mastitis Control in the New York City Milk Shed 527
"Seedy Belly" in Gilts 529
Treatment for Chorea 529
Acetonemia in Milk Cows 530
Intussusception in the Dog 531
Pyometra in Bitches 532
Canine Hysteria 534
Morphine Pentobarbital Anesthesia for Dogs 535
Lavage and Gavage in Dog and Cat Practice 536
Annual Index 540-543

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75 E. Wacker Drive
Chicago, U. S. A.

Junior FORT DODGE BIO-CHEMIC REVIEW

DECEMBER 1934

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●

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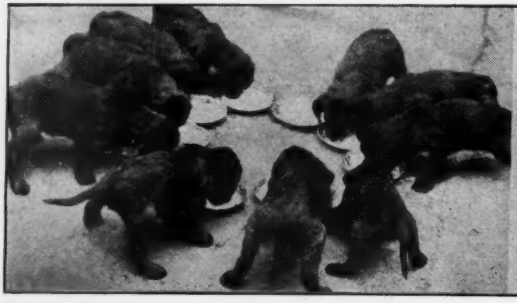

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Veterinary Medicine

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor
H. J. Mostyn, R.K.O. Bldg., New York, Eastern Representative

Reproduction is a complex function which, to be understood, requires a knowledge of the normal functioning of each part of the genital system.

The corpus luteum is a temporary endocrine gland which normally forms in the ovary after each egg cell is produced. If it fails to regress at the proper time, its presence may prevent the occurrence of heat.

A congenital condition infrequently causing sterility is persistent hymen. This structure is usually present in a rudimentary state only. When it persists, it may interfere with the normal breeding act.

The term "functional sterility" is often applied to conditions in which the normal function is lacking yet no evidence of disease can be found in the tubular parts. Two conditions of this sort rather frequently seen are cystic ovary and retention of the corpus luteum. The cause of cystic ovary is not definitely known. It is often found in association with infections of the uterus but may occur independently. When the condition is advanced, the cow may show very frequent or even constant heat. Long established cases may exhibit some mannerisms of the opposite sex.

Sterility is a symptom of a diseased condition or abnormal functioning of some part or parts of the genital system. To treat sterility properly, it is first essential to make an accurate diagnosis.

Infections of the tubular parts of the genital system are by far the most frequent cause of sterility in cows. Probably in 80 to 90% of sterility infection is involved. Many different organisms are capable of causing disease processes in the genital organs.

Experiments carried out to determine the absorption of acriflavine by trypanosomes seem to confirm Ehrlich's theories and to prove that normal trypanosomes possess a marked avidity for the drug, but the avidity of resistant trypanosomes is little or nil.

Developments during the last two years indicate the beginning of a shortage in the supply of work horses and mules, which may eventually reach serious proportions. The time when this shortage will be greatest must necessarily depend somewhat upon programs of average reduction and the further mechanization of agriculture, but present indications are that with the proposed programs in effect, the probability of overproduction of horses is remote.

Lime and superphosphate when applied to the walks and platforms in the dairy barn kill a large number of bacteria.

* * * *

The shell of a hen's egg holds about two fluid ounces, but a prehistoric bird, the Aepyornis laid eggs with a capacity of 258 fluid ounces or over two gallons.—*S. N. L.*, 25:686.

* * * *

At present iodin is, in a few localities, being fed to cows on a commercial scale, and the product is advertised and sold as iodized milk. This practice is encouraged by certain concerns interested in the sale of iodin-containing feeds. The results, according to all experimental evidence available, are extremely variable.

* * * *

Experiments carried out by Seddon and Rose in Australia showed that vaccination with autogenous vaccine is of very real value in controlling bovine streptococcic mastitis. The vaccine is standardized to contain 4,000 million cocci per cubic centimeter. A total of 20cc, given in two injections of 10cc with an interval of 5 to 10 days between, are administered subcutaneously to each cow. The use of the vaccine is preventive rather than curative. Following its administration the incidence and severity of mastitis is much less than in herds not treated.

* * * *

Baer suggests that the curative action of the larvae of *Lucilia sericata* is not only due to their ingesting dead material, but also to some biochemical substance formed while they were present in the tissues. Livingston and Prince suggest that the therapeutic agent is produced in the tissues by contact with the larvae; it not only destroys pathogenic bacteria, but it is in time inimical to the larvae themselves. The diseased parts become increasingly alkaline, and this change, together with the scavenger activities of the larvae, render the tissues an unfavorable medium for further bacterial invasion and growth.

The veterinary profession has grown into a sympathetic viewpoint toward the dog fancy and the dog breeders. Much of the misunderstanding and criticism of the past have been eliminated. Too many dog breeders were trying to be veterinarians and too many veterinarians, without the proper background, were trying to be dog specialists. Improved laboratory facilities and more specialization in canine practice have given us a greater number of satisfactory veterinary hospitals.—Editorial in the *Dog World*.

* * * *

Hudack and McMaster have found that intradermal injections with a fine needle tear open the tiny lymphatics. Within a minute or two a minute plexus of extensively anastomosing channels in the superficial layer of the corium is seen. Serums and bacterial products are daily being injected into the skin of patients for diagnostic or therapeutic purposes. The great rôle of the skin in resistance to infection is always realized and emphasized, for the skin presents, so to speak, the first line of defense against the outside world of pathogenic bacteria. Skin diseases in general present many and varied problems. In all of these fields the part played by the lymphatics must be an important one.—*Jour. A. M. A.*, 102:20.

* * * *

The flood of worthless and even harmful dog foods on the market is deplorable. The dog food industry is too new to have eliminated its undesirables. The cheap price at which many canned dog foods are sold is evidence in itself of poor quality. The cost of the can, the labor of filling it, the cost of transportation and handling cannot be less than six cents. If anything of food value for the dog is put into the can, it doesn't retail at this price or near it. The best dog food is, in the long run, the least expensive. Many ailments of dogs are due directly to poor food, many others are due indirectly to the same cause. Beware of the can of dog food that has nothing in it fit for the dog.

The common belief that raw foods are essential to highest physical vigor lacks scientific support, according to a report to the American Chemical Society.—*S. N. L.* 26:699.

* * * *

Any program to control mastitis in a herd depends first of all upon early diagnosis of the disease and the prevention of spread of the infection to the other cows in the herd. It is possible for the milker to carry the causal organisms on his hands from cow to cow, but apparently this is not so often the method as is usually believed. Of scientific interest is the observation that when infection was experimentally induced in one quarter of a cow's udder, this infection usually did not spread to any of the other quarters, although no effort to prevent such spread was made by the experimenters.—Univ. of Wis. *Bul.* No. 425.

* * * *

A large percentage of the dogs brought to veterinarians for treatment are, unknown to their owners, suffering primarily from nutritional ailments. The domestic dog is restricted greatly in his selection of food. The chance that he will receive a balanced diet when fed table scraps and occasional purchases of meat or meat scrap from the market, is indeed small. Unfortunately the commercial dog food industry is of such recent development that the unworthy manufacturers have not yet been weeded out and unless discrimination is employed, the likelihood of obtaining a suitable commercial food for a dog is not much better than leaving it to chance. Unless the dog owner is willing to confine his purchases of commercial dog food to a few of the well known and thoroughly reliable firms, he should seek the advice of his veterinarian as to what to feed his dog. An improper diet is a direct cause of many ailments of dogs, not only of the digestive system but of the bones, the eyes, the skin and other organs. Further, it lowers their resistance to disease and to parasites, thus increasing the likelihood of illness and lessening the chance of recovery. The desirability of a dog for a pet depends very much upon how it is fed.

Contrary to popular belief, glass, powdered or broken to particles varying in size from very fine to fairly coarse, does not cause death when ingested by dogs. The whole or by far the greater proportion of the glass given passes through the alimentary tract in the course of 96 hours without causing ill effects.

* * * *

The effects of feeding dogs on a diet markedly deficient in vitamin-A consisted in the development of a characteristic ophthalmia after widely varying periods of time. Other symptoms were inconsistent and inconclusive, except a terminal loss of appetite, weight and strength, frequently followed by death. A noteworthy feature of the results was the sudden development of the ophthalmia without significant premonitory symptoms. It suggests that in A-avitaminosis, profound physiological changes may occur without being detected by available means. The experiments indicate further that great individual differences exist in susceptibility to vitamin-A deprivation.

* * * *

A Pet Burial Park, open to all kinds of pet animals, has been dedicated recently by fanciers in San Antonio, Texas. There are nine dogs, a cat, and a pet wild cat already interred there. The Pet Burial Park is being offered to pet owners on a membership plan. Each member will be deeded one burial plot as his own property, along with an interest in the entire cemetery and its equipment. A member may obtain additional burial space by purchasing an additional membership. There will be room in the Park for about 800 animals. The cemetery, consisting of two acres of beautiful hillside land, is being landscaped and laid out on a definite plan; it will have a caretaker in constant charge, and a house has been placed on the property for his living quarters. A trust fund is being set up from the sale of memberships, and the interest from the fund will provide perpetual care at no cost to the members. —*Amer. Ken. Gaz.* 53:21.

Experiments carried out at the human trypanomiasis research institute, Entebbe, Uganda, seem to indicate that the individual vertebrate host may exert an influence on the power of a trypanosome to develop in tsetse disease. On removal to a new host, either by cyclical or direct transmission, the power may be fully recovered.

The infective larvae of Ostertagia spp. and Trichostrongylus spp. may be differentiated readily and fairly accurately from a consideration of their total lengths. The differentiation can be carried out with the ordinary low power of the microscope and, hence, saves time and tedium when examining large numbers of cultures.

In horse parasite control experiments at the University of Illinois, it was found that horses given a tonic of sodium cacodylate following the administration of oil of chenopodium improved faster than the control animals given only the strongylicide, or the group given tonics other than sodium cacodylate.

In view of the infective character of the virus of laryngo-tracheitis which remains dormant in the throat of recovered fowls, it is important to protect young chicks against infection in brooder houses or in transit. It is also important to rear young stock in quarters separate from mature fowls. Innumerable outbreaks in young pullets suggest that recovered, mature fowls are a common source of the disease.

The true primary or specific myiasis-producing flies lay their eggs in the smallest wound, cut, abrasion, etc., and their larvae rapidly invade and destroy healthy tissue, opening the way to further bacterial infection and invasion of tissue later, by the secondary or semispecific myiasis-producing species. *Cochliomyia macellaria* are not primary myiasis-producing flies, that is, they do not lay their eggs in fresh, clean cuts, wounds, etc., but only in diseased tissues where there is much decomposing animal matter.

A measurable degree of immunity against fowl-pox was produced in different groups of fowls four weeks to five months of age by the feather-follicle instillation of one per cent aqueous solution of fresh pigeon-pox vaccine. The length of the artificially induced immunity has not been established.

Tracing the effects of vitamin-E deficiencies of poultry it was found that the changes taking place in the spermatozoa under conditions of vitamin-E deficiency are associated with the incomplete development of globules of fat and fatty acids, material that normally occurs in the head of the sperm. Sperm smears taken at intervals showed that many of the mature spermatozoa were affected by vitamin-E deficiency, while others, produced at the same time, remained normal.

Where poultry houses become infested with the hen flea, the birds should be removed and the house thoroughly cleaned. Bury the droppings and burn all litter. All parts of the interior should be sprayed with disinfectant. The ground around the house, where the litter was burned and the droppings buried, should also be sprayed. The hens, as they are returned to the house, should be immersed in a solution of disinfectant.

Bacteria-free and cell-free filtrates of the blood and other tissues of birds affected with fowl paralysis, neurolymphomatosis gallinarum, and erythro- and myeloid leucosis when injected into susceptible birds, may produce the same form of the disease as that of the donor, or they may produce any of the several expressions of the disease. Moreover, one form may change into another during the course of the disease, or two or more forms may exist in combination. These experiments support the view that the so-called neurolymphomatosis of fowls and the erythro- and myeloid leucosis are different expressions in response to a common filterable agent.

The only safe procedure in diagnosing a cestode parasite is to determine the identification solely on the basis of the anatomy of the specimens and, lacking any ground of differentiation, to include them in an already existing species, irrespective of the type of the host.

Experimental infection of sheep with *Chabertia ovina* were followed in about one month by the production of diarrhea which was accompanied by the passage of much blood and mucus. In these infections such evidence of diarrhea persisted for from one to two months, during which period many immature worms were also passed.

Direct centrifugal flotation is the most accurate technique as yet devised for diagnosing the presence of eggs in fox feces. The dilution egg count technique gives an approximate estimate of the extent of infection present. Eggs per gram of feces provide a smoother measure than egg counts per day.

Heavy rain apparently destroys hookworm larvae in the soil. Sodium chloride solution will destroy hookworm larvae in the soil. The adult worms do not inflict severe injury on the intestinal musoca. Cellular debris forms the major portion of their food. The worm ingests the tip of the villus but does not penetrate into the submucosa. Anemia is the outstanding pathological condition found on autopsy in heavily infested foxes.

Experiments conducted at the University of Sidney (Australia) indicate that the anthelmintic efficiency of copper sulphate may be due largely to its ability to pass in solution direct to the abomasum, in a high percentage of cases, and that the use of this solution as a vehicle may make possible the direct passage of other drugs to the abomasum, with a consequent increase in efficiency against such small or large bowel parasites as Trichostrongylus spp., *Oesophagostomum columbianum*, and *Chabertia ovina*.

Foxes become infected with hookworm larvae either by way of the mouth or skin.

The average color index of foxes' blood is .41 for males, ranging from .26 to .67; for females it is .42, ranging from .22 to .62.

The average weight of hemoglobin per 100cc of foxes' blood is 9.50gm in males, varying from 3.7gm to 13.9 gm, and 9.67gm in females, varying from 3.8gm to 15.4gm.

The number of lymphocytes per cubic millimeter of foxes' blood is 805 to 9,480, with an average of 3,951 in males; in females the count varies from 960 to 9,010, with an average of 3,712.

The number of monocytes per cubic millimeter of foxes' blood varies from 0 to 736, with an average of 186 in the male; in the female the count varies between 0 and 918, with an average of 165.

The number of neutrophile leucocytes in fox blood varies between 1,375 and 11,771, with an average of 4,219 in the male; in the female the count varies between 990 and 11,640, with an average of 4,296.

The number of basophiles per cubic millimeter of foxes' blood varies between 320 and 1,828, with an average of 727 in males; in females the count ranges between 345 and 810, with an average of 609.

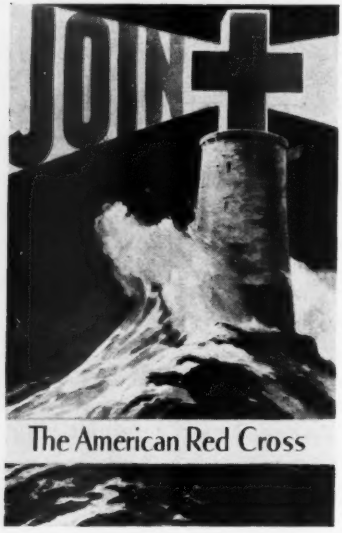
The average number of red blood corpuscles per cubic-millimeter of the blood of foxes is 8,150,000 for males, varying from 3,424,000 to 11,840,000, and 8,145,000 for females varying from 3,488,000 to 11,700,000.

The number of blood platelets in adult foxes range from 96,000 to 480,000, with an average of 281,471. The clotting time of the blood varies from 40 seconds to 98 seconds, with an average clotting time of 58 seconds in the adult fox.

The Red Cross Reaches Into Millions of Homes

The Red Cross—as a symbol of service or a symbol of mercy—touches the lives of millions of Americans.

In five years of economic depression and partial recovery Red Cross has given direct relief to one out of every five persons in the United States. These were



victims of unemployment, drought, tornado, flood, earthquake and other catastrophes.

An average of 100 disasters each year call for Red Cross aid to thousands of sufferers, who are given food, clothing, shelter, medical aid and help in regaining self-support.

More than a million men and women, boys and girls, wear the insignia of Red Cross Life Saving or First Aid. These safety services were taught this year to 70,000 men employed on federal relief projects and to key men in every Civilian Conservation Camp.

Each year a quarter million disabled ex-service men and dependents, and men in the regular Army, Navy and Marine Corps and their families receive the friendly assistance of the Red Cross workers.

Red Cross public health nurses visit the sick in city and rural homes. They have aided at the birth of more than 19,000 babies during the depression years and also made 1,289,000 visits to or in behalf of more than 100,000 maternity cases. Thousands of children reached by these nurses have had conditions of malnutrition discovered and checked.

In homes and in institutions the blind are furnished with Braille literature through the skill of Red Cross Braille workers who print these books.

Almost 7,000,000 school boys and girls, members of Junior Red Cross, wear buttons with the motto "I Serve."

To carry on this humanitarian work more than 100,000 men and women volunteer their services through the 3,700 chapters and 10,000 Red Cross branches.

Four million men and women join the Red Cross as members every year. Their membership dues furnish the funds for Red Cross work.

Federal Meat Inspection

The federal meat inspection is a far flung service. Its heart is in Washington, but its pulse is felt throughout 745 packing establishments in 257 cities and towns. It reaches from the docks of New York City to the docks of San Francisco. It inspects, before entry into this country, meat food products from the Argentine and lamb from New Zealand, in fact all imported meats and meat products. In the year ended June 30, 1932, it supervised the slaughter and inspection of 77,200,091 animals, at an average cost of about 7 cents for each animal. It condemned as being unfit for food 256,150 whole carcasses and parts of 964,276 other carcasses, not including 613,778 cattle livers and 25,906 calf livers. It supervised the preparation and processing of 8,289,881,799 pounds of meat and meat food products. It inspected and passed 30,938,832 pounds of import meat and meat food products, condemned 21,304 pounds and refused entry to 135,436 pounds.—*Hygeia.*

Bovine Tuberculosis Eradication

The first survey to determine the approximate extent of tuberculosis throughout the United States was conducted in 1922 and showed that about 4 percent of all the cattle were affected with the disease. Since the time of the first survey the extent of the infection has been steadily reduced.

All of the tuberculin testing of cattle has been performed by veterinarians, much of it by accredited veterinary practitioners working under state and Federal direction. Adoption of milk ordinances by municipalities, requiring their dairy products to be obtained from cattle that have passed the tuberculin test, has been very helpful to the campaign.

Since 1916 tuberculosis in cattle slaughtered, exclusive of known reactors, has decreased from 2.35 percent to 0.4 percent. Since 1924 the percentage of tuberculosis in hogs slaughtered under Federal supervision has decreased from 15.2 percent to 10.5 percent.

Tuberculin used in detecting tuberculosis in the living animal has been prepared by the Federal Bureau of Animal Industry since 1893. The cleaning and disinfection of premises previously occupied by tuberculous cattle are important. It too is carried out under veterinary supervision. There are now under supervision for the eradication of tuberculosis 4,600,000 herds, containing 43,000,000 cattle, which is about 65 percent of the total number in the country. Cooperating veterinarians have applied approximately 130,000,000 tuberculin tests to cattle. As a result about 3,000,000 reactors have been removed and destroyed. More than 60 percent of all the counties in the United States are now classed as modified accredited areas—areas in which less than one-half of one percent of the cattle are affected with tuberculosis. The work is progressing rapidly. Seventeen states are now in the list in which tuberculin testing has shown that less than one-half of one percent of the cattle are tuberculous.

Better Veterinary Conventions

Taking them altogether, there is a rather amazing number of veterinary organizations functioning more or less actively. Including the national, state, district, county and city associations and the special associations, live stock sanitary, research, small animal practitioners, etc., the number of veterinary association meetings held in a year possibly exceeds 200. An average attendance of 50 would make a total attendance of 10,000. Disregarding the city and county associations, attending the meetings of which usually occasions little expense or loss of time, there are left perhaps 75 conventions a year, attendance at which takes the veterinarian away from his home and entails travel expense and loss of time from his practice or other work, whatever it may be. If we assume an average attendance of 80 at such meetings, the yearly total amounts to 6,000. If the average travel and hotel expense be $25.00 and the average time spent at the convention and going and returning, three days, it aggregates $150,000 in money and 18,000 days in time, a rather large yearly expenditure for a small group and one for which the returns should be considered seriously.

A large majority of veterinary association meetings are held during the winter months. Association officials are already planning programs and other features of the meetings to be held during the approaching winter season. Some remarks[1] on the subject of conventions by Mr. Sheets, Secretary-Treasurer of The National Retail Hardware Association, apply equally to veterinary conventions and probably to most others. His statements are worth pondering by those into whose hands are entrusted the arrangements for our meetings, i. e., for the expenditure of upwards of $150,000 and 18,000 to 20,000 days. Mr. Sheets said in part:

It has long seemed to me that many conventions fail woefully in their purpose, if they have a purpose, and that high costs are incurred in their conduct and attendance without an adequate return.

With the very great increase in the number of organizations of various kinds during the last few years, conventions seem to be taken as a sort of matter of course, and often are apparently held for little better reason than that it is the recognized thing to do. Not only are conventions held as a matter of course, but many people attend largely through force of habit, without much thought of receiving very great benefit or contributing to the benefit of others.

I have always conceived that a convention ought to have a well-defined objective and an equally well-defined plan to attain that objective. Far too much convention planning fails in both these essentials, with the result that there is vast waste of both time and money.

Entirely too much time and thought are usually given to recreation and entertainment. Side issues of all kinds are permitted to take the time that should be given to the convention sessions. Traveling 500 or 1,000 miles to play eighteen holes of golf or attend a couple of shows is decidedly expensive.

The waste of time so characteristic of many conventions, in their conduct as well as in their auxiliary features, is little short of appalling. Away from home, the majority of men seem to throw off their regular habits and clothe themselves with new ones.

At home they find no difficulty whatever in getting to their work at 8:30 or 9:00 o'clock, but few of them are able to be present at 9:30 or 10:00 o'clock convention openings. And after they do ramble in half an hour or so later, they often become so weary with the proceedings that they feel they must leave before adjournment. Frequently I find myself wondering why such men go to conventions at all.

But waste of time by organization officers through failure to open the sessions at the scheduled hour, failing to keep the program moving in orderly fashion and to adjourn at the proper time is even less excusable. If a convention is worth holding it is worth conducting in a businesslike way, with specific hours, and in keeping with a pre-determined schedule. Few things "get my goat" quite so much as convention officers wander-

[1]Sheets, Herbert P., Conventions Should Have Objectives: Waste of Time, Money and Energy Characterizes Most Conventions—Some Ways of Eliminating This Waste, Printers' Ink,

ing onto the platform twenty or thirty minutes after the time which has been set for the session to start.

Whoever has charge of program preparation, whether committee or individual, should think *through* and plan well into the future. Unless there is continuity of thought there can be no orderly sequence of convention programs and much of their potential value will be lost. Programs, subject matter and treatment should be designed for logical sequence rather than the haphazard fashion by which one program may bear little relationship to those which have preceded.

The major theme should be determined first, then properly subdivided to fit the number of sessions desired—or, more important, to cover completely the major theme, with the number of sessions adjusted to theme necessity. Speakers should be selected for their ability to present a determined subject. There is little of value in fitting the subject to a speaker.

The subject matter for each speaker should be carefully outlined so as to coordinate with the other topics, that the program in its entirety will involve a complete discussion of all phases of the major theme. Without such outlining and coordination of the divisional subjects, the several talks may be developed along such different lines as to have little common focus on the chief objective.

Of course each speaker should be told the time allotted to him, and then the convention managers should play fair with him by starting the sessions on time and working in clocklike fashion so that each speaker can be introduced at the scheduled time to present his talk without unnecessary hurry or overlapping of the time of the speaker to follow.

I am in full accord with the idea of cutting out of every speech all the needless jokes and near jokes, the labored prologues, apologies and other explanations with which a great many speakers waste a lot of time.

* * * *

Vitamin D Milk

Vitamin D Milk is an outstanding example of the successful teaming up of pure science with industrial research. This is one reason why it should command the confidence of scientific and professional men.

In 1924, Dr. Harry Steenbock and his associates working in the laboratories of the University of Wisconsin, announced the tremendously important fact that certain foods can be activated by exposure to ultraviolet rays and that these foods then carry the antirachitic factor. This finding was confirmed almost simultaneously by the late Dr. Alfred F. Hess working independently at Columbia University.

A patent covering the production of vitamin D by irradiation was issued to Doctor Steenbock in 1928 and assigned by him to the Wisconsin Alumni Research Foundation to administer in the interest of the general public. The first commercial application to the direct irradiation of milk was made by Dr. G. C. Supplee and his associates, in the laboratories of the Dry Milk Company. In another direction, Dr. C. N. Frey and Mr. R. F. Light of the Fleischmann Laboratories cooperated with Doctor Steenbock in supplying yeast for irradiation and in carrying out a series of studies on the feeding of this irradiated yeast to dairy cows. Dr. B. H. Thomas of the Walker-Gordon Laboratories and Dr. F. L. MacLeod of Columbia University compared the feeding of irradiated yeast and irradiated ergosterol and reported that it required twice as many units of vitamin D in the form of irradiated ergosterol as in the form of irradiated yeast to obtain milks of equal potency. Comparable results from ergosterol feeding were reported by Drs. Krauss, Bethke and Monroe of the Ohio Agricultural Experiment Station.

Dr. Theodore F. Zucker of Columbia University found that the antirachitic factor of cod liver oil could be extracted and was able to prepare a concentrate much more active than the original oil. The patent covering this process was granted to Doctor Zucker in 1928 and assigned to University Patents, Inc., a subsidiary of Columbia University.

The three methods of increasing the vitamin D content of milk, yeast-feeding, irradiation and addition of a cod liver oil concentrate, are handled commercially by licensing producers and regulating production under definite standards of potency. A fourth method, being developed by American Research Products, Inc., a subsidiary of General Mills, involves the addition to milk of ergosterol activated by exposure to cathode rays from the tube developed by Dr. W. D. Coolidge of the General Electric Company.

Neoplasms of Captive Wild Animals

Report of Five Cases*

By CARL F. SCHLOTTHAUER,
Rochester, Minnesota,
Division of Experimental Medicine,
The Mayo Clinic.

TRUE neoplasms are frequently observed in man and in the domesticated animal. Captive wild animals, and wild animals in their natural state, are likewise affected, but the reported number of observations is as yet small; the largest number of observations has been reported from zoölogical collections. In these, the incidence is rather high. In 5,365 captive wild animals collected by the Zoölogical Society of Philadelphia in nineteen years, Fox[3] observed ninety-four neoplasms in ninety-two animals. This is an incidence of 1.7 per cent. Much valuable information in regard to neoplastic disease of captive wild animals also has come from other zoölogical collections. Dr. C. V. Noback[4], veterinarian for the New York Zoölogical Society, reported the following neoplasms of captive wild animals: A large fibroma of the uterus in an aged Blesbok *(Bubalis albifrons)*; a sarcoma of the lungs and liver of a collared peccary *(Tagassu tajacu)*; a malignant melanoblastoma of the skin over the neck, axillary lymph nodes, lungs, pericardium, pleura, liver, and mesentery of an Australian wild dog *(Canis dingo)*; an osteosarcoma affecting the distal end of the left radius and ulna of a leopard *(Felis pardus)*; a round cell sarcoma of the inguinal, abdominal, and axillary regions of a male chocma baboon *(Papio porcarius)*; and a round cell sarcoma in the pharyngeal region with secondary lesion in the abdomen of an Australian wild dog *(Canis dingo)*. Doctor Noback at present has some interesting pathologic specimens on which he plans to report in the future. Numerous isolated observations of neoplasms in captive wild animals have been reported. Recently, Doyle[2] observed a large hepatoma in an aged lion *(Felis leo)*. Delez[1] reported a carcinoma of the ovary of an elephant *(Elephas indicus)*.

I recently had the opportunity to study three neoplasms in silver foxes *(Vulpes fulvis)*, one in a raccoon *(Procyon lotor)*, and one in a black bear *(Ursus Americanus)*. Two of these neoplasms have been reported elsewhere.[5,6] However, it seems advisable to include them in this group report.

Report of Cases

Case 1.—This was an osteogenic sarcoma affecting the bones of the face and the mandible of a silver fox. The neoplastic specimen was secured by Dr. R. G. Green of the Department of Bacteriology and Immunology, University of Minnesota. He stated that marked enlargement of the muzzle of this fox had been noted before death. Instead of being narrow and pointed, the muzzle had been broad, flat and rather blunt. After the animal had been killed, and the skin had been removed, it was noted that the enlargement resulted from dilatation of

Fig. 1. Osteosarcoma of the bones of the face of a silver fox, cut across midway in the muzzle. Dilation of the sinuses is evident.

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the maxillary sinuses (fig. 1). The bones were pliable and could be cut easily with a knife. They resembled dense fibrous tissue. None of the soft tissues was affected. The bones posterior to the eyes were apparently normal. There was no gross or microscopic evidence of metastasis to other parts of the body.

Case 2.—This was an adenocarcinoma of the left lobe of the thyroid gland of a silver fox (fig. 2). This specimen, too, was secured by Dr. R. G. Green. The chief signs displayed by this fox had been general weakness and convulsions. Enlargement of the neck had been observed before death. At necropsy, the left lobe of the thyroid gland was greatly enlarged so that it measured 3.5 by 5 by 8 cm. Some calcification was noted within the lobe. Many metastatic nodules were present in the lungs. Metastasis to other organs could not be demonstrated. Histologic study of the neoplastic thyroid gland, and of the lesions in the lungs, revealed the latter to be metastatic from the thyroid gland; both growths were typical thyroid adenocarcinomas.

Fig. 2. Thyroid lobes and trachea of a silver fox cut across at the largest point. Carcinomatous left lobe.

Case 3.—A pinealoma of a silver fox[6] was obtained by Dr. J. E. Shillinger, who is in charge of disease investigations, Bureau of Biological Survey, United States Department of Agriculture, Washington, D. C. Pinealoma is very infrequently found in man, and this apparently is the first case to be reported in which such a growth was found in a lower animal. The tumor was large, grayish-white, pedunculated, and rather firm. It was situated in the transverse fissure, between the right cerebral hemisphere and the cerebellum (fig. 3). It was about as large as the cerebellum, which was crowded ventrally and to the left. There was marked distortion of this part of the brain.

Fig. 3. Brain and tumor from a silver fox. *T*, neoplasm, a large pinealoma. *Ce*, displaced cerebellum.

Case 4.—An aged black bear, that had spent twenty years in a park in Rochester, Minnesota, died of natural causes[5]. Necropsy revealed many pulmonary calculi, a cystic adenoma of the left lobe of the thyroid gland, and a small tumor in each testis. These latter nodules were true neoplasms. They were aggressive and appeared to be invading the seminiferous tubules. Because of the variability of opinions concerning neoplasms of this sort, I am referring to them as tumors of the interstitial cells of the testes.

Case 5.—A captive raccoon was brought to me because of a large, ulcerating tumor on the left ramus of the mandible. The tumor appeared as a smooth, rounded mass projecting upward beneath the tongue (fig. 4). It almost completely filled the intermandibular space. Because of the size and situation of this neoplasm it seemed advisable to destroy the animal. This was done

by inhalation of ether; necropsy was performed. There was no evidence of neoplastic disease elsewhere in this animal. A roentgenogram of the neoplasm of the mandible revealed some destruction of bone of the left ramus. Histologic study of this tumor disclosed that it was an endothelioma. It was of a rather low grade of malignancy,

Fig. 4. Epithelioma on the left ramus of the mandible of a raccoon. The entire intermandibular space is filled by the tumor.

and it was composed largely of inflammatory and fibrous tissue. There were no areas of calcification.

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Urine Examination in Diagnosis

WHILE the practicing veterinarian employs, as a rule, the microscope in the diagnosis of parasitic infections of the digestive and cutaneous systems, there is nevertheless a great need for some of the simpler methods for the examination of the blood and urine of domestic animals. The urine, especially, can be made a very useful aid in many cases.

The routine laboratory analysis of the urine, while not complex in itself, ordinarily takes too much time and equipment for field work; and even for the average veterinary hospital it is not altogether practical. This resumé is, therefore, designed for rapid and useful though incomplete examination of the urine.

Obtaining and preservation of samples is of vast importance. In all animals catheterization may be employed if time and equipment permit. It is sometimes possible to cause small animals to void urine by pressing or squeezing the urocyst, through the abdominal walls. The mare and cow will often micturate if the vaginal orifice of the urethra is irritated mechanically. The urine should be received in a clean receptacle and immediately transferred into a wide-mouthed bottle. If it can be placed in an ice-box or tested immediately no further precautions need be taken. Preservation, however, may be instituted through the addition of a piece of camphor, crystal of thymol, or a few drops of an alcoholic solution of salicylic acid. Chloroform should be avoided as it sinks to the bottom and mixes with the sediment. Formalin may interfere with the chemical reactions.

ALBUMEN, in large amounts over a long period of time, must be considered an abnormal constituent of the urine. Minute traces, however, may be found in healthy individuals at certain

points in the metabolic cycle. Blood, lymph, or semen in the urine may bring about an "albumen reaction"; the presence of blood or pus is termed *accidental albuminuria*. Nephritis or cystitis, as well as any febrile or inflammatory disease, tumors, disturbed nutrition, and mercury or lead poisoning, cause a distinct albuminuria. A simple and satisfactory test is the layering of a few cubic centimeters of the urine to be tested on cold, concentrated nitric acid in a test tube (Heller's Test). If albumen is present a sharply defined white ring will appear at once, or after a few minutes, at the point of contact.

THE presence of sugar in the urine may be divided into two groups; simple glycosuria, a temporary condition associated with certain diseases of the nervous, digestive and respiratory systems, and diabetes mellitus, a condition practically unknown in animals other than man. Its presence is of diagnostic value in functional and organic diseases of the liver, severe pulmonary diseases, diseases of the central nervous system, and arsenic poisoning.

In testing for the presence of sugar in the urine Benedict's solution is prefered to Fehling's due to the fact that it is more stable and more easily handled. Eight drops of the urine in question are added to 5cc of the reagent and the mixture *boiled* in a test tube for two minutes. If sugar is present a yellow, red, or green precipitate will appear.

THE modified Rothera test for acetone (ketone) bodies is of inestimable value in the diagnosis of acetonemia (atypical milk fever) of cattle. Two reagents are needed; No. 1 consists of one part of finely powdered sodium-nitroprusside thoroughly mixed with 100 parts of ammonium sulphate, C.P. No. 2 is either a pinch of sodium hydroxide flakes or a saturated solution of ammonium hydroxide. Five cc of the freshly-drawn urine is placed in a test tube and about one gram of reagent No. 1 dissolved in it. A pinch of the flakes or 2cc of the ammonium hydroxide solution is then added, and, if the sample is positive for ketones, a permanganate color develops. The permanganate color deepens on standing. It is also deeper the more severe the case. The reaction is striking and definite. It enables the practitioner to make a positive diagnosis in these cases and apply a specific treatment of high effacy, where formerly he could do little.

THE microscopical examination of the urine is probably the most valuable in diagnosing affections of the urinary tract. In this procedure fresh urine should always be used. Samples should first be centrifuged, the supernatant liquid poured off, and some of the sediment placed, or smeared, on a slide. A coverglass will prevent excessive evaporation. The preparation may be examined directly with the low and then the high power. The results may be classified as follows:

1. Blood and leucocytes.
   a. Inflammation or trauma of the kidneys, ureters, bladder, urethra or vagina.
2. Epithelial cells from the bladder, ureters, urethra, vagina.
   a. Of no special significance unless copious.
3. Cells from the pelvis of the kidney.
   a. Renal affections.
4. Epithelial, hemorrhagic or waxy casts.
   a. Severe nephritis.
5. Hyalin or granular casts.
   a. Mild nephritis.
6. Cancer cells.
7. Micro-organisms (in stained preparations).
   a. *Corynebacterium renalis bovis.*
   b. *B. coli.*
   c. Staphlococci and streptococci.
8. Spermatozoa.
9. Minute concretions.
   a. Bladder, kidney pelvis, urethra.
   b. Prostatitis.

Buffalo, N. Y. R. B. McClelland.

Chicago Medical Libraries

By BURTON R. ROGERS,
Chicago, Illinois

A reproach of veterinary writers in this country, both those recording scientific research and those discussing other phases of veterinary science, is the failure to credit the work of predecessors in the same field.

I believe the chief reason for this open discourtesy on the part of veterinary writers is due to the fact that in most instances, the literature of their predecessors is, in the main, unavailable and since in most instances the writers do not have the references, they have fallen into the slovenly habit of not referring to them at all. The examples of this are so numerous in our veterinary journals and veterinary bulletins and our veterinary books that I deem it wholly unnecessary to point them out.

The greatest deficiency as I observe it, in the education of veterinary students, a deficiency that handicaps them not a little in practice and particularly in handling the business side of their practices, is their total unfamiliarity with anything that has gone before in the profession which they have adopted as a career. There are practically no young veterinarians in this country but believe subconsciously and to a considerable extent, actually and fully, that the veterinary profession originated about the time they entered school. I see this in their writings and in their letters, not occasionally, but all the time.

The reason for this, probably, is the fact that most of them graduate from schools with totally inadequate library facilities for faculty and students, and with no background of the history of their profession, an attitude akin to that of the artisan towards his trade; but not that of other professions. Such a thing would not be tolerated in law, in medicine or theology. The young lawyer that did not know something of Blackstone, a young physician unfamiliar with the writings of Hippocrates and Galen, or a young clergyman who knew nothing of the developments of religion in ancient and medieval times, would be looked upon as an ignoramus by his confreres. What shall we say of the novitiate in veterinary medicine that knows nothing of its development? Well this can be said if he did not acquire the reading habit while a student it is ten to one he will not acquire it afterwards and he will leave the profession pretty much as he entered it.

In this matter, the condition of the veterinary profession has not improved with the higher entrance requirements of our colleges and the standards for graduation that have come about gradually—very gradually during the past 25 years. I am informed by those familiar with the sale of veterinary books to students and practitioners 25 years ago and now, that on the average the veterinary student of today buys far fewer books than his predecessor and that after leaving school, he purchases only about 10% as many books as did the young practitioner of a generation ago.

Every year a large number of practicing veterinarians and veterinarians engaged in research visit Chicago to attend conventions or other gatherings or on vacation. It is possible they may be interested in knowing about the 352,000 medical books and magazines in the ten medical and scientific libraries of Chicago and their method of classification of books and subjects.

Volumes	Library and Location
95,000	John Crerar, 86 East Randolph, 12th Floor.
56,000	University Chicago Bio-Medical, 60th and Cottage Grove.
40,000	American College of Surgeons, 40 East Erie Street
66,000	Northwestern University 303 East Chicago Avenue.

43,000	Quine Medical Library, University Illinois, 1817 West Polk.
33,000	Rush Medical College, 1758 West Harrison St.
8,000	Michael Reese Hospital, 2900 Ellis Ave.
5,000	American Medican Association, 535 North Dearborn St.
5,000	Loyola Medical School, 706 S. Lincoln St.

The John Crerar Library is one of the two or three finest scientific libraries in this country, and probably has nearly all the books contained in the other libraries listed. It has more veterinary volumes than any of the others. If any veterinarians have old rare books, it would be a good place to donate them, as they would probably be available to a larger number of future veterinarians there than anywhere else in the world.

The John Crerar Library is also the most convenient and less than a block from the Chicago "Loop," at the corner of Randolph Street and Michigan Avenue, just across the street north from the Chicago Public Library. One takes the elevator to the 13th floor, where coats and hats can be checked free and wash rooms and toilet facilities are located. The library is open from 9 a. m. to 6 p. m., except Sundays and holidays.

The general reading room and where card indexes by three classifications indicate every volume in the library, is located on the top or 14th floor. On the 12th floor is the medical reading room and the periodical section, and card indexes of the 95,000 medical volumes—cards by "authors"—cards by Book Titles—and more important than all—cards by the Dewey Decimal system of subject classification, where all books on a certain narrow field are grouped. The farther the decimal point is carried to the right the finer the detail classification.

Courteous attendants are present always to supply any volume requested or to otherwise serve guests, but there is an advantage in knowing the system (Dewey) of classification by subjects, so that one may just "browse" around in the catalogue and thus run on to unexpected treasures and delightful surprises every few minutes. The Dewey classification is exceedingly simple but remarkably efficient. It can be understood almost at a glance.

The primary classification of all literature under the Dewey system is into ten general groups indicated by the figure on the extreme left, viz.,

0. to 99.99999	being	General Subjects Under 100
100. to 199.99999	being	Philosophy.....100's
200. to 299.99999	being	Religion.....200's
300. to 399.	being	Sociology.....300's
400. to 499.	being	Philology .....400's
500. to 599.	being	Natural Science.....500's
600. to 699.	being	Useful Arts .....600's
700. to 799.	being	Fine Arts.....700's
800. to 899.	being	Literature.....800's
900. to 999.	being	History.....900's

In other words all the 100's are on philosophy—all the 200's are on religion—all the 300's on sociology, all the 500's on Natural Sciences (all the 591's being domesticated animals)—and all the 600's are on the useful arts, including medicine (the 610's). Everything on medicine has the first two figures "61," and all veterinary subjects are under 619's.

The 500's or Natural Sciences are divided into ten main sub-divisions, the second figure or the figure following the "5" classifying them as follows:

500's NATURAL SCIENCE

510's Mathematics	560's Paleontology
520's Astronomy	570's BIOLOGY
530's Physics	580's Botany
540's CHEMISTRY	590's ZOOLOGY
550's Geology	

Cards for animal life or Zoology are placed together under 59's and these are again re-grouped and subdivided as follows:

590's	ZOOLOGY
591's	Physiological Zoology
591.1	Physiology
591.11	Circulation
591.12	Respiration
591.121	Respiration Natural
591.122	Respiration Dermal
591.123	Respiration Aquatic-vascular
591.124	Respiration Brancheal
591.125	Respiration Tracheal
591.126	Respiration Pulmonary
529.129	Respiration Exhalation, Aqueous Vapor
591.13	Nutrition
591.14	Secretion and Excretion
591.15	Variations
591.16	Generation
591.17	Histogenesis
591.18	NERVE Functions and Cells

591.19 Physiological Chemistry
591.2 PATHOLOGY
591.3 Embryology
591.4 Morphology
591.5 Habits
591.6 Economics of animals
591.7 Anatomy and Organography
591.8 *Histology*
591.9 Geographical Distribution
599. Mammals
599.7 Ungulates, Carnivora, Domesticated
599.8 Monkeys
599.9 Man

The Useful Arts, including medicine are under the 600's and again ten main groups, viz.:

600's Useful Arts (general)
610's MEDICINE MEDICAL 620's
630's Agriculture
640's Home and Domestic Science
650's 660's 670's 680's 690's Etc.

In other words, all medical subject index cards are under the 61's (610 to 619), a total of over 95,000 cards.

The 61's or Medicine are subdivided into ten main groups, viz.:

610's MEDICAL, General and Publications
611's Anatomy
612's Physiology
613's Hygiene
614's Public Health
615's Therapeutics and Materia Medics
616's PATHOLOGY
617's Surgery
618's Women and Children
619's VETERINARY

The 611's or ANATOMY are again subdivided into many groups by figures now carried to the right of the decimal to several points, e. g.:

611. ANATOMY
611.01 Theory
611.012 Teratology
611.013 Embryology
611.014 Anthropology
611.016 Paleonthological
611.018 HISTOLOGY
611.1 Anatomy, Circulatory
611.2 Anatomy, Respiratory
611.3 Anatomy, Digestive
611.4 Anatomy, Glandular
611.6 Anatomy, Genito-Urinary
611.7 Anatomy, Muscular and Skin
611.8 Anatomy, Nervous
611.9 Anatomy, Regional

The 612's or Medical PHYSIOLOGY are subdivided by ten figures to the right of the decimal point, as is Anatomy, thus:

612. PHYSIOLOGY
612.01 Physiology of Cells
612.1 Physiology of Circulation
612.2 Physiology of Respiration
612.3 Physiology of Digestion
612.4 Physiology of Glands
612.6 Physiology of Genito-Urinary
612.7 Physiology of Motor Apparatus
612.8 Physiology of Nervous Systems

The 615's or Therapeutics are again subdivided on the same basis, e. g.:

615's THERAPEUTICS and Materia Medica
615.1 Therapeutics of Diseases of Circulation
615.2 Therapeutics of Respiratory Diseases
615.3 Therapeutics of Digestive Organs
615.4 Therapeutics of Glands
615.6 Therapeutics Genito-Urinary Diseases
615.7 Therapeutics of Muscular and Cutaneous Organs
615.8 Treatment of Nervous System Diseases, etc.

The 616's or PATHOLOGY, group together all cards dealing with pathology and disease, e. g.:

616's PATHOLOGY and DISEASE.
616.01 Pathology of Cells
616.1 Pathology of Circulation
616.2 Pathology of Respiratory Organs
616.3 Pathology and Diseases of Digestive Organs
616.4 Pathology and Diseases of Glands
616.6 Pathology and Diseases of Reproductive Urinary Organs
616.7 Pathology and Diseases of Muscular and Cutaneous
616.8 Pathology and Diseases of Nervous System

The 617's group all Surgical Subjects together as above:

617's SURGERY
617.1 Surgery of Circulatory Organs
617.2 Surgery of Respiratory Organs
617.3 Surgery of Digestive Organs
617.4 Surgery of Glands
617.6 Surgery of Genito-Urinary Organs
617.7 Surgery of Muscles
617.8 Surgery of Nervous System

The 619's are VETERINARY MEDICINE. The first figure to the right of the decimal indicates the animal species, and then the same system is followed as heretofore in the next figures.

619's VETERINARY MEDICINE
619.1 Horses and Asses
619.2 Cattle
619.3 Sheep and Goats
619.4 Swine
619.5 Poultry
619.6 Birds
619.7 Dogs
619.8 Cats and others
619.9 Miscellaneous
619.90 Hygiene

619.91 Infectious
619.92 Parasites
619.93 Pathology and Diseases
619.95 Feeding
619.96 Transportation
619.97 Slaughter
619.971 Painless Extinction, etc.

Under 630's or Agriculture are also subjects of interest to veterinarians, viz.:

630's Agriculture
636. Agriculture, Domestic Animals
636.1 Agriculture, Horses
636.2 Agriculture, Cattle
636.3 Agriculture, Sheep and Goats
636.4 Agriculture, Swine
636.5 Agriculture, Poultry
636.7 Agriculture, Dogs
636.8 Agriculture, Cats
636.9 Agriculture, Rabbits, Guinea Pigs, Elephants, Foxes
637. Agriculture, Dairy
638. Agriculture, Bees
639. Agriculture, Hunting, Trapping, Fishing

682's include horse-shoeing and blacksmithing and these cards should be ran over.

Another feature, on the cards, Roman capital letters indicate the year or decade of publication, and the newer books are placed on cards in front, and the older books on any one subject further back. This is a convenience in appraising the scope of the book but not essential to finding it in the card catalog.

A-B-C—Ancient and Middle age Books
D—16th Century Books
E—17th Century Books
F—18th Century Books
G—Books published in the 1800's
H—Books published in the 1810's
I—Books published in the 1820's
J—Books published in the 1830's
K—Books published in the 1840's
L—Books published in the 1850's
M—Books published in the 1860's
N—Books published in the 1870's
O—Books published in the 1880's
P—Books published in the 1890's
Q—Books published in the 1900's
R—Books published in the 1910's
S—Books published in the 1920's
T—Books published in the 1930's
Futures
U—Books published in the 1940's

Furthermore, following the letter on the cards is a three figure number, indicating the particular year of the decade it was published and these again in the order book was received by the John Crerar Library, e. g., the third book received in 1931 on Pathology of the Digestive Organs would be 616.3—T103.

Some examples of books and magazines in the John Crerar Library follow ("L" means a large book and "A" a large Atlas):

L591.051	A514	American Journal of Physiology
L591.051	J824	Journal of Physiology—Rockefeller Institute
L591.4	P502	Dissection of Cat for Physiology Instruction
591.1	P500	Veterinary Physiology — Fred Smith
591.4	P602	Outlines of Veterinary Anatomy
591.4	P100	Comparative Anatomy—Chauveau
L591.498	S001	Surgical Anatomy of the Horse
L591.4	P301	Atlas of Horse—Ellenberger
L591.17	100	Horse in Motion—Stillman
591.4314	N900	Teeth of Horse
591.07197		Anatomy Lymphatics of the Cat —Huntington
L591.4	R300	Regional Anatomy of Domestic Animals—Montane
591.477	R100	Compar. Anatomy of Domestic Animals—Paoli
L591.4	Q801	Anatomie of Pferdes—Ellenberger and Baum
L591.4	Q603	Anatomie of Pferdes—Ellenberger and Baum
L591.4	Q301	Vety Anatomy—Chauveau
591.4	N200	Vety Anatomy—Chauveau
591.1	Q900	Physiology Domestic Animals—Robert Meade Smith
591.1	O901	Animal Physiology—Wesley Mills
L599.725	S201	Dissection of the Cranial Nerves of the Horse
L599.725	S200	Vety Anatomy—Schmaltz (Published in 1922)
599.725	R900	Vety Anatomy—Schmaltz (Published in 1912)
L599.725	R400	Anatomy of Horse—Ellenberger
599.725	Q801	Anatomy of Horse—Jenkins
599.725	Q201	Anatomy of Horse—Ellenberger
599.725	Q202	Anatomy of Horse—McFadyean
L599.75	P900	Atlas Anatomy of Horse—Leisering
L599.725	L700	Anatomy, Physiology and Dissection of Horse (Published in 1857)
SA599.725	J200	Anatomy of Horse—Gurlt (Published in 1832)
A599.725	F1	Anatomy of Horse—Stubbs (Published in 18th Century)
L741.	L5512	Anatomy—Leonardo Da Vinci (Published in 1519)
599.73	Q001	Anatomy of Pig
L599.735	R900	Anatomy—Atlas of Dairy Cow
L599.735	R200	Lymphatic System of Ox—[redacted]—Baum
599.735	Q201	Atlas Anatomy of Ox
599.735	Q202	Physiology of Ox—Schmidt
L599.75	Q900	Anatomy of Animals—Schmalz
599.75	M100	Vety Anatomy—Gamgee and Jas. Law (Published in 1861)
599.74	O600	Anatomy Technology by Wilder and Simon Gage
599.74	020	Anatomy—Wilder and Green

Useful Capsules

A very useful capsule for equine and bovine practice may be made as follows:

Crush 75 anti-flatus tablets (each containing 10 grains salicylic acid; 7½ grains ginger; 7½ grains cloves, with activated charcoal) into a fine powder.

In a common granite wash basin mix eight ounces powdered ginger; eight ounces powdered nux; four ounces powdered capsicum, and 24 ounces finely pulverized ammonium carbonate. Stir well and sneeze freely.

Fill a small medicine glass full of antiseptine, or any other refined cresol for internal use, and place an eye dropper in it.

Also, in another glass, with an eye dropper, pour in the following mixture: Two ounces saturated solution gum camphor in oil of eucalyptus; one ounce each of oil of peppermint and oil of cajuput.

Filling the Capsules

With all the ingredients mixed, and the liquids at hand, we first half fill a No. 10 capsule with powder, tamp it lightly, and with an eight-penny nail, make a small hole in the mass. We then add an eye dropper full of antiseptine. We next place some more powder in the capsule, make another hole in it, and add an eye dropper full of oil. This keeps the liquid in the center of the capsule, and it is soon absorbed, without touching the gelatine of the container. Each dropper contains about 60 drops, and by using a dropper for each solution the work is much speeded up. The capsule is now firmly filled with powder, the end filled also, and pressed down firmly.

After all are filled, we take a small piece of cotton, and unfasten each capsule slightly, and wipe off all the powder on the outside. With another small piece of cotton, dipped in cold water, we draw this around the edge of the capsule, and slip the top back on again with a rotating motion. It will seal the capsule, and make it "tighter" than a small-town banker. There will also be no danger of the top coming off while playing around with a vicious horse or stubborn cow.

The above amounts of drugs will fill around 75 No. 10 capsules, each one containing about 60 grains ginger; 50 grains nux; 25 grains capsicum; 10 grains salicylic acid; 7½ grains cloves; 150 grains ammonium carbonate; 60 minims each of the antiseptine and oils. The whole capsule weighs about 425 grains, or nearly an ounce.

They may be termed an improved Reeks' capsule, and can be used for almost everything except financial constipation. We usually omit the capsicum for summer use, but add plenty of it for cold weather. The goofus bird of Central America, as you may well know, lives entirely on red pepper, but has to fly backwards in summer to keep cool.

We also make up a number of No. 11 capsules for colt and calf work, and they will be found equally efficacious for these little patients.

We like to make up about 75 at a time, and prefer a bright day, as that seems to prevent a lot of sneezing and coryza. Perhaps they may be purchased just as cheaply from any of the supply houses, but we prefer this particular formula for our location.

Sedative Capsules

Another excellent capsule is made by mixing eight ounces each of chloral hydrate and powdered gum acacia together and filling No. 10 or 11 capsules. In this way, the chloral will not dissolve the gelatine of the capsule, and will keep for a long time. The acacia also acts as an emollient to the gastric mucus membranes, for the chloral, unless well diluted, is very irritating.

Cannabis was always our favorite hypnotic for horses, but when the price of it climbed out of sight during the "Hoover boom," we turned to chloral, and have kept using it ever since.

Giving Capsules

Just a word about "shooting" a capsule to a horse or cow. We use an old, lightweight Bland balling gun, although we have a later model too heavy and cumbersome for everyday use.

Slip the loaded gun along the right side of the horse's mouth, placing the left hand on the muzzle of the animal. Quickly slip the gun over the back of the tongue, and push the capsule on top of the tongue. Pinch the nose slightly, and withdraw the gun quickly. Before the patient realizes whether it is August or Christmas, the capsule has been gulped into the esophagus, and is on its way.

For a cow, grasp her nostrils with the left hand, and slip the gun over the tongue. One "swaller" and the capsule is getting acquainted with the pillars of the rumen, wherever they may be.

Do not try to hold the tongue or prize the mouth too wide open. Use a quiet, gentle method, and the work will be accomplished before either the patient or the owner realizes it.

E. T. Baker.

Moscow, Idaho.

A Quart of Milk Daily

In making up their estimates of the amount of milk that should be consumed, food authorities have in mind supplying the amount of mineral matter and vitamins on the one hand and the amount of energy the body requires on the other. When they state that one quart of milk is the desired amount they mean that this quart of milk can be used in fluid form together with certain amounts of cheese and ice cream or in any way that represents the total solids in one quart of milk, whether it be in the form of fluid milk or part fluid milk and the balance in cheese or ice cream. This does not include the energy requirements, however, which the butter supplies.

Food authorities estimate that in order to supply the body requirements of energy and heat, the average consumption of fat should be forty-six pounds per person annually and this is where the butter requirement comes in. While no food authorities have specified the exact amount of butter that should be consumed, they do agree, however, that it is desirable for each person to have one and one-half ounces of butter per day because it is the only fat with any considerable amount of Vitamin A and some D and is easily digested and assimilated. One and one-half ounces per day is approximately the equivalent of thirty-four pounds per person yearly.

The government estimates that approximately forty-three per cent of the total milk products is now used in the manufacture of butter. This includes both farm and creamery butter. This disposes of forty-three and three-quarter billion pounds of milk. The government estimates that forty-two per cent or approximately forty-two and three-quarter billion pounds of all milk produced is consumed in the form of fluid milk and cream. Approximately four and one-half per cent of all milk produced is used in making cheese and about two and one-half per cent in the manufacture of ice cream.

Expressing the amount of ice cream and cheese that was used last year in terms of milk and adding it to the amount of fluid milk that was consumed, the total is equal to nine-tenths of a pint daily for each person as against the one quart recommended by scientists.

The government estimates that the average per capita consumption of butter at the present time is eighteen pounds as against the thirty-four pounds which is the desirable amount to be consumed. The consumption of this added sixteen pounds per person would nearly double the amount of milk required for the manufacture of butter. Of course these are all maximum desires amounts to probably will never be fully reached, but it does offer an enormous opportunity to the industry for increasing the consumption of milk and its products.—*M. D. Munn in Hoard's Dairyman.*

Metallic Poisoning in Domestic Animals

By W. F. WITTER
Farmingdale, New York

THERE occurs among farm animals certain sudden and mysterious deaths which cannot be attributed to any infectious disease or other apparent cause. A careful investigation of such cases often reveals the cause of death to be metallic poisoning. The malicious poisoning of larger animals is rare, but accidental poisoning is very common. Many of the metals, which enter into the composition of substances in common use, are harmful to animal life and may cause sudden death if ingested in sufficiently large amounts. It is necessary, however, that in order to be harmful the metal be in a form which can be absorbed.

Metals are also used to quite a large extent in the preparation of drugs used by the veterinarian. An overdose of some of these medicines is highly toxic.

Lead poisoning is by far the most common form of metallic poisoning in animals. This is explained by the wide distribution of lead, the variety of lead preparations used in agriculture, and the tendency of lead to form compounds that are easily absorbed. Cattle are the most frequent victims, partly because they are more sensitive to lead poisoning than other animals, but chiefly because of their feeding habits. A cow will lick objects and chew on substances that other animals will not touch.

Arsenate of lead is one of the most common causes of lead poisoning in domestic animals. Although this compound contains arsenic, the poisoning is probably due to the lead. Arsenate of lead is used extensively as a spray for orchards and gardens, and often the grass in the orchards and adjoining fields will be covered with sufficient poison to be fatal, especially if the animals have access to the grass soon after the spraying. Pails, tubs, and buckets which have been used to mix the spray are often accessible to animals, and occasionally some careless attendant may use such a container for feeding or watering the stock.

Recently near Auburn, N. Y., a farmer lost six cows and had several more very seriously sick. A chemical analysis of the stomach and contents showed arsenate of lead to be present. A survey of the premises was then made, and an old box which was about half full of arsenate of lead was found on a rubbish heap in the pasture. The farmer recalled that he had found the box around the barn about three years before, and, not knowing what the substance was, had thrown it away on the heap. Marks in the box and footprints all around the vicinity showed conclusively that the cows had been eating the arsenate of lead.

Paint is another source of lead that frequently accounts for the death of animals. There have been a large number of cases resulting fatally in which animals have died from licking white lead from the bottom of discarded paint cans, or from licking chipped paint from their stalls. There have even been cases reported where the cows have licked sufficient amounts of paint from billboards standing in the pasture to cause their death.

Lead in its metallic form also can be absorbed if it remains in the digestive tract for a long period. This type of poisoning is rare, but a few cases have been reported in which bits of melted lead and bullet splashes have been eaten and have caused chronic lead poisoning. Certain types of water, under special conditions, will dissolve enough lead from lead pipe to cause poisoning. This, too, is rare.

Mercury is another metal that is poisonous, but fortunately its use is restricted. Some of the remedies used in the treatment of mange and lice contain mercury, and occasionally patients die as a result of licking mercurial ointment either from their own bodies or from others in the herd. Bichloride of mercury is used extensively in dairies to preserve composite samples of milk for the butterfat test. Occasionally someone mistakes bichloride tablets for medicine and gives them to a sick animal with disastrous results. Accidents of this sort are reduced in number by the fact that manufacturers give these tablets a distinctive color and make them in the shape of a coffin with skull and crossbones on both sides.

Chemically speaking, arsenic is not a metal, but it is a closely related substance and is the cause of many accidental poisonings. Paris green, a compound of arsenic and copper, is still used extensively on potatoes, although it is being rapidly replaced by other mixtures. It may be ingested by animals accidentally when a potato field adjoints a pasture. Cattle sometimes gain access to Paris green left in the field or around the stable.

Poisoning with copper is relatively infrequent. Copper sulphate is the most common form of copper used in connection with animals. It is sometimes used as a dressing for grain to keep crows and other birds from eating the grain after it is planted. Occasionally some of this grain is eaten by poultry or it may be fed to animals accidentally. Sheep infested with stomach worms, *Haemonchus contortis,* are usually treated with copper sulphate, and occasionally an overdose is given with disastrous results.

Certain compounds of antimony, zinc, silver, barium, chromium, and iron are poisonous. Some of these compounds are used in the preparation of a few of our common drugs, and poisoning occurs following an overdose. Others may be used as poisons for rodents.

Treatment of such cases of poisoning is commonly unsuccessful as the animal is usually dead before the cause is known. There are no specific lesions which characterize each poison; as a group they produce about the same changes. If death occurs very suddenly (within six to ten hours) there are no gross lesions, although the liver may show a slight destruction of the parenchyma, microscopically. But if death does not occur as quickly, there is a very marked hemorrhagic gastro-enteritis. It is impossible for a veterinarian to make a positive diagnosis of poisoning from the gross lesions. A chemical analysis is the conclusive evidence, both as to its occurrence and as to the particular poison involved.

If the farmer is warned about the various methods by which his animals may be poisoned, he will be careful and avoid the causes, especially those due to carelessness. Until the knowledge of the poisonous properties of materials commonly found on the farm becomes universally disseminated, inexplicable deaths will continue to occur.

* * * *

Stomach Tube Catheter

It may be of interest to record that the stomach tube may be made to serve as an excellent catheter for the horse, especially the more modern red rubber variety, flexible and nicely rounded at the end.

Caught without a catheter, twelve miles from home, at a case that badly needed catheterization, the stomach tube was tried as a possible substitute, with very happy results. When the penis was withdrawn and the tube well lubricated with linseed oil, it was found that it entered the meatus and was passed into the bladder without trouble.

Since then I have used it many times, and now do not bother about the ordinary catheter, with its annoying habit of hardening and cracking up when lying unused for any length of time.—C. P. Hynes in *The Veterinary Record,* 14:33.

Veterinary Dental Anesthesia

IT HAS been my recent experience to visit a dentist and have several wisdom teeth extracted. I was greatly surprised at the painlessness of the minor operation. The dentist who performed the extraction left a great impression on me by his answer to my question whether he intended to use a local or a general anesthetic. "Local," he replied gustfully, "because there is no need in this day and age of causing a man to be senseless all over for only a minor operation." By means of a swift explanation he described the process of nerve-blocking in human dentistry. This, needless to say, aroused my curiosity as to the use of this procedure in the veterinary profession.

The process involved in any dentistry is, of course, the blocking of the cranial nerves supplying either side of either jaw. The enervation for both the upper and lower teeth is through the trigeminus or fifth cranial nerve. This nerve is divided. The part supplying the upper teeth is the maxillary nerve and the part supplying the lower, the mandibular. The branch to the teeth of the upper jaw is called the infra-orbital nerve, the largest of all the maxillary branches. This is also divided, giving off a posterior, a middle, and an anterior branch. The posterior branch passes through a small foramen in the tuber maxillare and supplies the posterior molar teeth and the maxillary sinus. The middle branch is given off into the infra-orbital canal and constitutes the chief nerve supply to the cheek, the teeth, and the maxillary sinus. The anterior branches supply the canine and the incisor teeth. For the lower jaw, the mandibular nerve gives off branches within the mandible corresponding to the nerves of the upper jaw.

The anesthetic used especially for horses is alypin in a 5% solution. Alypin is a derivative of the benzol group, a synthetic product and apparently non-toxic for horses in reasonable doses. 10cc of a 10% solution have been injected into a horse of average size without visible reaction. The alypin should be dissolved in Ringer's solution, a sterile, normal salt solution made from distilled water containing a trace of calcium chloride. Normal salt solution inflicts the least possible injury upon the tissues and the calcium salt adds to its penetrating power. Adrenalin chloride 1-100 prolongs the action when a few drops are added to the solution.

For dogs, procaine is the preferred anesthetic because it is constant in its action and comparatively non-toxic. Approximately 2cc of a 2% solution are used. The anesthesia should be complete in 10 minutes and should last about 20 minutes.

The technique of injecting in animals is only slightly difficult. Gingival injections of local anesthesia which serve an excellent purpose in human dentistry are not easy to administer around the teeth of animals. It would be a very trying problem to inject a horse or dog around the fourth, fifth, or sixth grinder. Then, too, the fangs are too deeply imbedded to be reached by a gingival injection.

The procedure for these injections has been improved quite recently. Nerve blocking in dental anesthesia of animals was first used by Bemis in 1915. His method consisted of injecting around the infra-orbital nerve sufficiently to block the sensation in the upper teeth as follows: The site of injection is selected on the side of the face opposite the lateral canthus of the eye and just inferior to the facial crest of the horse; care being used to keep above the transerse facial vessels. The field being carefully shaved and sterilized, puncture the skin with a sterile needle, keeping the point directed upward and forward so that it will drop into the pterygo-pallatine fossa just posterior to the tuber maxillare. Push the needle in until it strikes the perpendicular portion of the palatine bone in the region of the maxillary foramen, about 6.5 to 7.5 cm. By this method it is possible to avoid puncturing the vena reflexa, which lies just posterior to the point of injection. Inject 5cc of 5% alypin solution

prepared as above. Anesthesia should be complete in 10 to 12 minutes following the injection and should last for 20 or 30 minutes.

At a later date, Van Des Eeckhout simplified the above method of nerve-blocking by injecting the anesthetic solution directly into the anterior end of the infra-orbital foramen.

For the dog, a method is proposed by Frank of Kansas, using the procaine solution. He injects at approximately the corresponding place in the dog that Bemis did in the horse. A point is located about 1½ inches below the lateral canthus of the eye, in the space between the posterior border of the malar bone and the anterior border of the coronoid process of the mandible.

The method of injecting for the mandibular nerve of the lower jaw has been a controversial matter. Bemis injected to block the mandibular nerve at the mandibular foramen, on the internal side of each ramus of the mandible. The approximate location on the horse can be ascertained by dropping a line from the center of the supra-orbital process to meet a line extended backward from the tables of the mandibular teeth. The structures may be palpated to obtain the location and to guide the needle. The quantity of anesthesia is identical with that for the infra-orbital nerve; 5cc of the 5% alypin solution.

When Van Des Eeckhout modified the injection upon the infra-orbital nerve, he also tried to simplify the injection for the mandibular. His method for the latter has not proved very satisfactory. He advised the injection into the mental foramen on the anterior external side of the mandible. This does not anesthetize the entire dentures of the lower jaw, probably because of its poor effect in flowing backwards along the mandibular nerve, thus not rendering the posterior molars painless.

Again, for the dog Frank describes the blocking of the mandibular nerve as an extremely simple process. The point of injection is obtained by passing the finger along the lower border of the mandible, from front to back, to the depression. Insert the needle at the lowest point of the depression close to the medial surface of the mandible and push it up for about one-half to three-quarters of an inch to the mandibular foramen and inject 2cc of the procaine solution, as for the upper jaw.

The benefits to be derived from such injections are obvious. In the first place, it is a humane method of treating these cases. Secondly, there is less danger from inhalation of blood and purulent material than under general anesthesia. Thirdly, the operators are relieved of the necessity of constantly administering or watching a general anesthesia which, at best, is very difficult to administer during dental operations. Fourthly, in dogs it is of great use while splitting and extracting teeth in cases of dental fistula. Fifthly, in the horse it has been used in the removal of a sequestrum of the lower jaw painlessly, and in repulsion, there is no flinching from the blows of the mallet or chisel. Nerve-blocking should be carried out in every dental case.

1. Local Anesthesia in Animal Dentistry. H. E. Bemis, Ames, Iowa. J. A. V. M. A., Vol. LI, 1917, p. 188.

2. Dental Anesthesia in the Dog. E. R. Frank, Kansas State Agriculture College, Manhattan, Kans. J. A. V. M. A., Vol. LXIII, 1928, p. 232.

3. The Haver-Glover Monthly Messenger, Vol. IX, No. 1, 1934.

Ray Huntsberger.

Middletown, N. Y.

Spent Bone Black

This mineral supplement for stock feeding is a by-product or refuse from the sugar and oil refining industries. When bones are heated in closed retorts, similar to those used for making coke from coal, the residual charcoal is known as bone black (animal charcoal). After the bone black has been used for some time by refineries for decolorizing their products it is turned on to the market for either fertilizer uses or for animal feeding.

Factors Causing Dystocia

Dystocia is an important phenomenon to the dairyman, the herdsman, and to the veterinarian. In the past much emphasis has been placed on the treatment of this condition while the causative factors have been overlooked. This particular branch of veterinary science presents many fascinating phases. A brief discussion of some of the main causes of these pathological presentations may prove of interest.

The improper breeding of animals presents the first basic cause of dystocia. Heredity bears a burden which cannot be overlooked. The Boston terrier and the bulldog of other types give us the most startling aspect of this factor. The cranium has been bred out of proportion to the maternal pelvis and mechanical obstruction has followed. Hydrocephalus is the result of this in-breeding which in many instances is the etiological factor both in the hydrocephalus and in lowering the function of the nervous system. This nervous depression tends toward suppressed fecundity. Caesarian section has been the salvation in many cases; embryotomy has aided in the removal of others.

In the dairy herds incest has caused some severe defects. The dam and sire may be genitally sound, but the in-breeding causes anatomical defects which result in dystocia even though the dams be functionally fertile. The ducts of Müller often show aberations in growth and development resulting in uterus unicornis, double cervix, and double uterus or both. The desire to bring together too closely particular blood lines often proves disastrous, since undesirable qualities as well as the desirable are intensified, and the undesirable may prove mortal, thus defeating the improvement.

The third major cause is pathological ovulation. In general, twinning in uniparous animals indicates disease and is a precursor of sterility in many instances. The anatomy of the bovine uterine horns tends to cause the twin fetuses to lie more or less in contact, and at term to present together. The mare with her more spacious uterine horns holds the twins in less apposition, but both also tend to present simultaneously with fatal results.

In dairy heifers we observe the fourth cause, which we classify as the condition of juvenile genital organs. This condition is first noted when the heifers are examined for pregnancy, sterility, or dystocia. Ovulation usually takes place about the sixth month in this class of dairy animal. Those individuals which have suffered from diarrhea, poor feeding, chronic pneumonia, and other diseases of the young are very apt to be underdeveloped in their genital tracts. The outstanding sign is the abnormally small vulva. Upon examination the cervix, uterus and ovaries are also found to be much smaller than normal. The present highly artificial methods of raising calves, with poor hygiene and feeding procedures as contributors, seems to malform the young heifer with dangerous sequelae.

Breeding young, sexually immature females may be considered as the next cause. It is hard to draw a fine division point between the immature heifers and those with juvenile genital organs. The normal dairy heifer ovulates at six months and bears her first calf at three years; breeding these animals to calve prior to this age is inadvisable. The small size of the genital tract and the severe drain on the young growing dam are conducive to dystocia.

The sire is well taken as the next cause. There is a common belief that a large sire bred to a small dam will result in a severe dystocia. Basically this view is unsound and has never been fully authenticated. The usual exciting cause has not been sought in these cases. However, when a large bull is bred to an immature or poorly raised heifer with small genitals, as discussed previously, the chances for a pathological presentation are much greater.

The examination of the sire is important also. A diseased sire predisposes the entire herd which he serves to infection with resulting dystocia.

Vigorous females are not as prone to pathological presentations as are their less healthy sisters. Any element or condition which lowers the natural resistance of the dam, such as poor feeding, improper housing, poor sanitation, and lack of exercise will predispose to unnatural calving at term. Bacteria, many of which are present in a non-pathogenic state in the vagina, uterus, cervix and oviducts and also the blood stream, readily become ruthless pathogens when the resistance of the dam is lowered. The ovum is endangered when the endometrium becomes involved and the uterine membranes and fetus are later vitally concerned. Again dystocia is foreseen.

Williams states that, "Dystocia is a natural result of the pathology of the reproductive organs and the fetus. In so far as the causes may be identified and removed dystocia is preventable. If the cause is not recognizable, or being recognizable, is not eliminated, dystocia ensues and the veterinary obstetrician must apply his skill to its amelioration or cure."

D. S. Stevenson.

Akron, Ohio.

Rickets—Historical

Rickets was established as a definite disease by the studies of Glisson in 1650, but little was known about the exact nature of the disease until 1885, when Pommer made his extensive studies of rachitic bones. Palm, in 1890, made a geographic study of the incidence of rickets, recommended the removal of rachitic children from large towns to sunny localities and set forth the value of sunlight in the treatment of rickets. Although Bucholz, in 1904, reported favorable results from treatments with artificial light, his findings attracted little attention. Huldschinsky reported in 1919 and 1920 on the specific curative action of ultraviolet rays from a mercury vapor quartz lamp and his findings were confirmed in 1920 and 1921 by Hess and Unger and others.

Diseased Animals a Hazard for Man

Unless precautions are taken, those whose occupations bring them in close contact with meats, hides and bones are in some danger of being infected by the materials they work in. Tuberculosis of the hand in butchers has been known for a long time. It sometimes goes by the name butcher's tubercle. In certain parts of the country undulant fever is fairly prevalent among butchers, raw meat appearing to be more important than raw milk in spreading the disease. Much of the tularemia is found among rabbit skinners. Human anthrax is not frequently encountered, but a large part of those who have it are handlers of hide and hair. Glanders, actinomycosis, malignant edema are diseases which man gets from association with animals or handling animal products.

An addition to the list has been made through experience in a Virginia button factory. The factory makes buttons out of bones shipped to them from various parts of the world. One of the most prevalent diseases in hogs is known as swine erysipelas.

It was not known that the bacillus was as tenacious of life as was demonstrated by this button factory experience. The bones used in button factories are from animals long since dead. They have been exposed to drying, to sunlight, and to other influences that disease bacteria do not stand well.

Doctor McGinnes investigated an outbreak of erysipeloid for the Virginia health department. This epidemic involved 210 persons who worked for ten months or less in a bone button factory. Epidemiologic study showed the disease to be due to the bacillus of swine erysipelas. The bacillus was found in the bones used in the factory, in the bone dust, and in the steep water as well as in the lesions of the persons infected with the disease.—*W. A. Evans in the Chicago Tribune.*

Rupture of the Bladder

IT IS difficult to obtain references concerning rupture of the bladder. The various textbooks on surgery give a very meager account of it or mention it not at all. Pathology texts ignore it, texts on medicine books do not even consider it.

Is this condition really so rare? In my short experience I have observed two cases of rupture of the bladder due to chronic ulceration, causing a weakness of the bladder wall with resultant rupture. Of this condition, namely rupture due to ulcers, I can find no mention in veterinary textbooks.

Both of the cases that I have seen occurred within a year. I shall attempt to describe them. The first was that of a six-year-old mare. She had been ailing for four or five days; no urine had been passed. The clinical manifestations were the common ones of peritonitis; namely, dullness, intermittent colic and anxious, staring expression with congestion of the mucosa. At first the animal had a slight temperature but that at length became normal, and on the fourth day was subnormal, a grave sign. The pulse was high at first but gradually fell. Respirations were about normal, perhaps a trifle slow. The mare had not eaten for three or four days but had shown considerable thirst. There was some soreness over the abdomen which was noticeably distended. The mare died on the fourth day, and along with the usual findings of peritonitis there was an enormous quantity of urine in the abdominal cavity. On examination the bladder showed an ulcer about three-quarter inch in diameter, situated on the fundus. Its thick, grey margins indicated chronicity. The bladder had a rent of considerable length extending from either side of the ulcer.

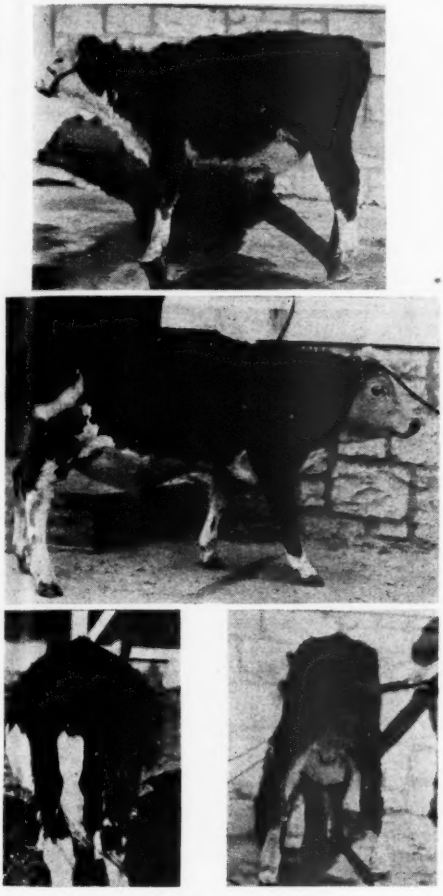
The second case occurred on a three-year-old, grade, Guernsey bull. This animal had shown spasmodic, colicky symptoms for four or five days with intermittent dullness and a tendency toward recumbency. There was suppression of urine and distention of the abdomen. A dull, splashing sound could be heard on percussion. Anorexia was complete. The intestine showed a considerable degree of paralysis. The contractions of the rumen were infrequent and weak. This was probably due to the intoxication. An autopsy was performed and upon opening the peritoneal cavity an enormous quantity of fluid gushed out. This was unmistakably urine. The quantity was estimated at fifteen gallons. The bladder showed the same condition as that of the bladder of the previous case, but the ulcer was greater in diameter and the vast rent in the wall was larger. Probably rupture due to ulceration of the bladder is the rarest of all causes. Pathologists could arrive at no explanation.

What may be a quite common cause is rupture due to blocking of the outlet of the bladder. This may be due to tumors (such as carcinomas), calculi, or twisting of the bladder so as to obstruct the outlet. I have never observed this condition and one textbook on diseases of small animals was the only place where I was able to find it discussed, although the *Journal of Comparative Pathology and Therapeutics* gives a brief account of it, as follows:

"The urine retained in the bladder gradually accumulates. The animal becomes dull or comatose with trembling of the muscles and a decrease in pulse, respiration and temperature. The animal quiets down and pain seems to have disappeared. The abdomen is sensitive and palpation causes the animal to evidence pain. The organ ruptures within two or three days. These are the symptoms of uremic poisoning. The animal then dies in a coma within a few hours."

It must be remembered that a distended bladder is easily ruptured when the animal is subjected to blows. This sometimes happens when dogs are struck by cars. It is well to remember this

point in dealing with large animals when they are cast. The bladder, if distended, should be emptied by catheterization so as to void its rupture when the animal



URETHRAL CALCULI

Top: Urethral rupture with distension of the sheath and adjacent tissue. Center: Rupture of the bladder with distension of the abdomen; also edema of the sheath and surroundings. Lower left: Rupture of the bladder and distension of the abdomen—"water belly." Lower right: Rupture of the urethra and infiltration of the sheath and surrounding tissue with urine.

strikes the ground. This may avoid some embarrassing situations. Rupture of the bladder in small animals in an attempt to empty it by manipulation before operation has been reported. This should be borne in mind and the bladder pressed upon with caution.

Frost reports rupture of the bladder in a mare due to injury from a broomhandle which had been maliciously thrust into the vagina. He also reports rupture of bladder in sheep due to calculi.

Gibbons observed a case in a bull. Until within a few hours of death the owner had failed to report that the bull had not passed urine since the onset. Autopsy revealed the organ to be split its entire length and further search revealed a calculus lodged near the S-shaped curve of the penis.

It is probable that rupture of the bladder is not met with to any great extent in veterinary practice, except in feeder steers and wethers, but it does occur.

C. P. Murray.

Glen Falls, N. Y.

Talk Not Always Cheap

"Talk is cheap"? Sometimes it's the most expensive pastime a man indulges in. Nature provided man with two arms, two legs and two eyes—in fact spare parts of most everything except special equipment he should use with care. And a tongue should be used with great caution. Recently a farmer talked a few of his neighbors into using a "hog cholera cure" in which he had implicit faith—although he had never tried it. The secret and mysteriously potent formula was given him gratis by a tramp he had given a few meals. It would have been an excellent remedy except that it neither prevented nor cured cholera. The sad part is, that cholera broke out in the neighborhood and misplaced faith in the "cholera cure," caused delay in getting competent help, and many suffered unnecessary losses. Talk may be cheap, but several in that community think otherwise. The laborer—and veterinarian—is worthy of his hire.

Mark Welsh.

College Park, Md.

Do You Remember?

1. Question. What are the functions of placental villi?

Answer. The primary function of villi in the placenta is to expose a greater area of the fetal membranes to contact with the mother's blood for the purposes of nutrition and excretion; a secondary function is that of support, or attachment to the wall of the uterus.

2. Q. Name the three primary germ layers in the embryo.

A. The three germ layers are: the ectoderm or outer layer, the mesoderm or middle layer, and the endoderm or inner layer.

3. Q. From which germ layers are each of the following derived: connective tissue, lens of the eye, liver, nervous tissue, peritoneum, striped muscle and the thymus gland?

A. Connective tissue is derived from the mesoderm, or more specifically, the mesenchyme; the lens of the eye develops from the ectoderm; the liver from the endoderm; nervous tissue from the ectoderm; the peritoneum from the mesoderm; striped muscle from the mesoderm; and the thymus gland develops from the endoderm.

4. Q. What are the successive centers of hemopoiesis in the fetus?

A. The first blood cells are formed in the yolk sac as "blood islands"; later, many cells may be formed from the mesenchyme; next, the liver becomes a very important center of blood formation; somewhat later the spleen and lymphatics are sufficiently developed to contribute various kinds of blood cells; the last but most important and permanent of the hemopoietic organs is the red bone marrow which remains the most important center of blood cell formation in the adult.

5. Q. The Wolffian and Mullerian ducts are part of what system in the fetus?

A. The Wolffian and Mullerian ducts in the fetus are part of the urogenital system. At first they are excretory in nature, later the Wolffian duct develops into some of the male generative organs while the Mullerian duct changes into the oviducts, the uterus and the vagina.

6. Q. What are the following: (a) allantois; (b) anlage; (c) archenteron; (d) area opaca; (e) Graafian follicle; (f) histogeneses; (g) lateral fold; (h) mesenchyme; (i) notochord; (j) oogenesis; (k) primitive streak; (1) somatopleure; (m) vegetal pole; (n) viviparous?

A. The (a) allantois is a sac or diverticulum of the hind gut which functions as an embryonal organ of respiration and excretion; (b) an anlage is the first trace of any organ or part of an embryo; (c) the archenteron is the gut cavity in the embryo; (d) the area opaca is the darker, more peripheral part of the germinal tissue surrounding the embryo; (e) the Graafian follicle is that part of the outer, secretory portion of the ovary from which the ovum is produced and developed; (f) histo-genesis is the differentiation of the cells of the germ layers into the tissues of various organs; (g) the lateral fold is that part of the somatopleure which bends upward and medially over the embryo to take part in the formation of the amnion and chorion; (h) mesenchyme is that type of undifferentiated mesoderm from which all connective tissue is formed; (i) the notochord is that part of the mesoderm in the embryo from which the axial skeleton develops; (j) oogenesis is the production and development of the egg cell; (k) the primitive streak is a linear condensation of the cells in the caudal end of the germinal area to form the first trace of the embryo; (l) the somatopleure is the body wall of the embryo, or the outer or upper layer of the mesoderm combined with the ectoderm which covers it; (m) the vegetal pole is that extremity of the ovum which contains the food yolk, in contrast to the other extremity or animal pole which contains the germ; (n) viviparous describes animals whose young are born alive.

Wesley O. Keefer.
Akron, Ohio.

Surgical Treatment of Fistulous Withers

The term fistula of the withers is used to describe any of a number of conditions resulting in an enlargement in this one region.

The primary lesions may be a chronic inflammation of the ligament due to parasitic invasion, followed by an inflammation of the supra-spinous bursa, which underlies the ligamentum nuchae. Bruising is probably an important contributing factor. The possibility of blood or lymph-borne infection localizing at this point is also recognized. The inflammation produces an increase in the amount of fluid which leads to a distention of the bursa. It may be unilateral or bilateral.

In preparing for the operation the patient should be fasted for six to ten hours to insure an empty stomach. The procedure to be followed after this should be somewhat as follows: Administer 1½-2 ounces of chloral hydrate in a quart of warm water via the stomach tube. Then shave the entire region of the withers and prepare the general body surface around this area to control dust or filth contamination during the operation. Confine the animal in stocks, on the ground or table. A curved probe pointed bistoury, a sharp scalpel, and a few pairs of artery forceps are all the instruments that are needed. Local anesthesia can now be applied to the operative area and the operations can begin as the general anesthesia is probably in effect by this time.

Make a linear incision on the lateral aspect of the region about midway between the proximal end of the scapula and the highest part of the withers beginning at a point about midway of the enlargement, and continue backward and downward, so that the posterior end of the incision is farther from the median line than the anterior end. Carry the incision through the skin and inflammatory tissue, down upon the expanded portion of the ligament. Remove all of the ligament that is found to be diseased, and then search for necrotic spines of the vertebrae and remove any found. If any pockets are found which are not drained by the incision, make counter openings wherever necessary. This may be done easily with the probe-pointed bistoury. Sometimes it is necessary to make an incision on the forward half of the enlargement; this is done in the same way excepting that the incision is carried forward and downward and away from the median line. Enlarge the incisions enough so that ample time will be allowed for drainage before healing of the skin takes place. Operate the opposite side in the same manner if both sides are involved. Do not make any incision extend across the median line. After granulation the edges of the wound across the median line tend to turn in and do not heal. A longitudinal incision on the median line is likewise bad because the weight of the skin on the sides of the shoulders keeps the edges apart.

Control any profuse skin hemorrhage with the artery forceps. Pack the cavities with strips of gauze saturated with boric acid or "B. F. I." powder. Allow the end of the gause to protrude from the upper opening. Now place a suture through the skin and the gauze to keep the pack in place and to exclude any dust or infection. After forty-eight hours remove the suture and the pack. Granulation tissue has now commenced to form and healing is taking place. Wipe out the cavities with dry cotton. Do not irrigate this wound. Apply a small amount of tinc-

ture of iodine on a cotton swab. Keep the drainage free, clean the external surface of the wound. A little vaseline applied to the skin and hair of the shoulder region and the leg is a great help in keeping the dried necrotic exudate of the wound from adhering to the skin and hair.

Following this method of treatment it is possible to operate upon fistulas of the withers and intrust most of the after care to the owner. The results are usually highly satisfactory.

Rudolph Steffen.

Horseheads, N. Y.

The Prevalence of True Sweeny

Sweeny may be defined as the condition resulting from the paralysis of the prescapular nerve which produces an atrophy of the subscapular and supraspinatus muscles of the shoulder. The atrophy may be in various degrees of intensity; from an almost imperceptible diminution in the size of the shoulder, to the most bony, wasted flatness, where the outline of the scapula is nearly as well seen as in the skeleton itself. Some writers call this condition shoulder-slip. It is very difficult to determine the prevalence of true sweeny. Horsemen consider atrophy of the shoulder muscles due to almost any cause, as sweeny. One of the older authors states, "Sweenied shoulders are more often due to disease below the fetlock than to affections above the elbow." This is obviously an impossibility in true sweeny.

There are various causes of true sweeny. Pressure from ill-fitting collars, especially in young horses, is believed to be the chief cause. Injuries such as kicks and other traumas are also given as causes. It is not always the fault of the owner that the collar causes pressure on the prescapular nerve. A collar may be fitted to a colt one day, and one week later one would not believe it could have possibly fitted the animal. A young horse, fat, soft and unaccustomed to work, if put in at heavy work, such as plowing, for a week will lose considerable weight, the shoulders will shrink, and the collar will no longer fit. This removes the guilt of a misfitting collar from carelessness of the owner and puts it upon his ignorance.

Many horsemen are under the impression that any atrophy of the shoulder is true sweeny and due to a paralysis of the prescapular nerve. This is incorrect. More than 70 per cent of the cases of atrophy of the shoulder muscles is due to some other cause. The statement made in the first paragraph may be corrected, therefore, to: "Atrophied shoulders are more often due to disease below the fetlocks than affections above the elbow."

A farmer in the vicinity of Ithaca had a roan gelding go lame. A "jockey" who lived in the neighborhood, saw the horse a week later. At this time the shoulder muscles were somewhat atrophied and the diagnosis of sweeny was made immediately. The horse was treated by blistering over the region of the atrophied shoulder muscles. The case did not improve with this treatment, and so a very powerful blister was applied. Still the horse did not improve. One month from the time the horse was noticed to be lame, and a veterinarian was called. He found a stub of wood about two inches long in the sole of the foot at the point of the frog. When the stub was removed the characteristic black, odoriferous pus shot out as though it was under a great pressure. The foot was treated in the proper way, the owner instructed to wash all the blisttering ointment from the animal's shoulder, and to treat the shoulder with an antiseptic emollient. In this case the shoulder had been blistered so severely that a collar could not be used on the horse for six weeks. Had the proper diagnosis been made at the first sign of lameness the horse could have been worked every day, instead of being laid up for two and a half months. Many practitioners have seen similar cases. Early veterinary writers called such cases "chest founder."

Clyde, N. Y. Erwin H. Jones.

Pulling Contests

Pulling contests were started purely as a scientific study of horses and mules. The Iowa State Experiment Station agricultural engineers invented and patented the dynamometer, and the Horse and Mule Association of America cooperated with the experiment station in tests which were continued for six months in both 1922 and 1923, during which tests, horses hauled loads 20 miles each day over gravel roads. These loads ran as high as 10 tons part of the time.

In conjunction with these tests, it was decided to hold some other short period tests to determine how big a load horses and mules could pull in an emergency, and how many horse power they could exert.

Engineers thought the limit was about 10 horse power per pair. The tests showed that any good pair could exert 20 horse power and many good pairs have exerted from 25 to 30 horse power for short periods.

Measurements have been taken and the characteristics of great pulling pairs studied, to determine what things are common to the horses or mules possessing greatest draft power. Out of these studies it has been determined that weight, great heart girth, correctly set feet and legs, and massive muscles, especially in the loin and hind quarters, are common characteristics which can be seen; but of equal importance is something which cannot be seen nor measured, which men call "courage," "determination" or the "never die spirit" which will not brook defeat, and which leads horses to give the last ounce of strength that is in them, whether on the race track or in pulling contests. This unconquerable spirit which makes winners, in men or in horses, is something that horsemen are seeking to develop in their own horses, by breeding from the strains that have been proved, in actual test, to possess unquenchable courage.—*Wayne Dinsmore.*

Improved Horse Breeding

There are almost 12 million horses and nearly 5 million mules on farms. Every farmer and every farm boy is interested in them. Constructive work which will bring about improvement in the type of horses and mules bred and raised will be of direct financial benefit to farmers who are fortunate enough to secure such better animals; for it costs no more to raise a good horse than a poor one, and the good animal does more effective work at less cost.

Garbage Poisoning in Swine

"The love of money is the root of all evil," so says the Good Book. It's a vice that's surprisingly common, however. But like virtue, is often its own reward. A city-bred man recently got a bad case of "easy money fever," which usually deprives the victim of his good judgment. He hired a colored man to haul garbage a round trip of thirty miles to feed about fifty hogs. If the shoats gained as much as a pound a day, the gross returns would be about $3.50 and the gross costs would be about the same. This would leave the rich garbage smell that perfumed the atmosphere as profit. Unfortunately, the truck driver got in a battle with old John Barleycorn and was knocked for a three-day loss on his pay check. The garbage, in the meantime, soured, fermented, molded, and putrified as well as developed innumerable maggots. Strangely, even the hardy hogs could not stand such a diet and several died. The owner, with a little encouragement, started figuring actual costs and possible returns on the venture, and decided there is little gold in garbage. The hogs left are now on grain and pasture—an old-fashioned, but safe way to raise pigs and profits. Hog cholera is not the only menace of the garbage-fed hog, even though it is the chief danger.

College Park, Md. Mark Welsh.

The Viability of Streptococci of Mastitis*

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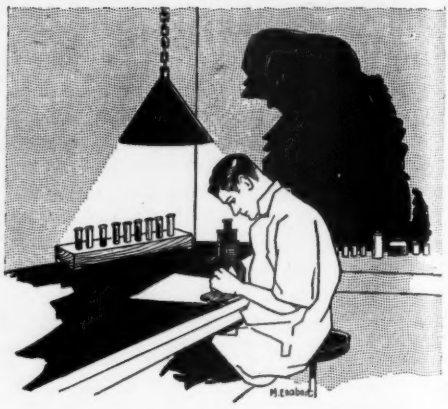
THE prevalence as well as the seriousness of infectious mastitis in dairy herds has made this disease one of the most important veterinary problems with which the dairyman must deal. It is for this reason that information concerning the manner in which the infection may be spread is valuable. It is known that the infectious organisms may leave the infected cow and be found in a living state in her environment.† The viability of such organisms determines the time during which they may be a source of danger if they gain entrance to the udders of non-infected cows.

Various members of the streptococcus group of organisms have been isolated from cases of infectious mastitis. To date no one classification has been entirely satisfactory in the naming of these bacteria; for this reason mention is made of them as *alpha, beta,* or *gamma* type on blood agar. This work was undertaken to determine the viability of streptococci of mastitis in some of the environmental conditions that they may be subjected to, upon being eliminated by an infected cow.

Procedure

The viability of *alpha, beta* and *gamma* types of streptococci of mastitis was determined when these organisms were exposed to drying and when mixed with sand, soil, burlap sacking, and tap water.



Ten-gram amounts of sand and fertile soil were placed in test tubes and sterilized, at 180° C. for one hour. Ten cubic centimeter amounts of tap water were placed into test tubes and sterilized by autoclaving at 15 pounds pressure for 30 minutes. The burlap sacking was cut into pieces two inches square, placed in petri dishes and sterilized at 180° C. for one hour.

A series composed of a tube each of sand, soil, tap water and burlap sacking was then inoculated with two cubic centimeters of 24-hour broth culture. Four drops were also placed in a sterile test tube. Similar series of materials were each inoculated with the *alpha, beta,* and *gamma* types of streptococci of mastitis. Sufficient tubes were prepared to permit daily cultural examinations to be made.

Tubes and petri dishes similar to the above were prepared and each one inoculated with two cubic centimeters of nutrient free suspension of the streptococci. This nutrient free suspension was obtained by growing the streptococci in dextrose veal infusion broth (pH 7.3), washing the cells free of nutrient material and suspending in sterile distilled water equal in amount to the original volume of the broth culture.

A series of the materials was also inoculated with two cubic centimeters of a broth culture of *Brucella suis* to simulate the work reported by Cameron[1] and thus

*Journal article No. 189 (n. s.) from the Mich. Agri. Exp. Sta.

†VETERINARY MEDICINE, 29:9, Sept., 1934, p. 384.

to serve as a check on the technique of the method used in this work. In the examination for the presence of viable *Brucella suis* liver infusion broth (pH 6.8) was employed. The organism was recovered and identified as the one used to inoculate the various materials.

These tubes and petri dishes were held at room temperature (approximately 22° C.) during the course of the experiment. This is similar to the temperatures encountered in the dairy barns.

Results and Discussion

The streptococci used in this experiment were isolated from active cases of infectious mastitis. The results obtained in two separate runs, in which broth cultures were used to inoculate the materials, are presented in table 1. In each case, one of the blood agar types of streptococci was used to inoculate a series of tubes. The findings were similar for the three types and thus, the one table serves to indicate the results obtained.

Table 1. Period of viability of *alpha, beta,* and *gamma* streptococci of mastitis when two cubic centimeters of broth culture was used to inoculate the various materials under study.

	First Trial	*Second Trial*
Sand (10 gm.)	58 days	66 days
Soil (10 gm.)	12 "	8 "
Burlap sacking	6 "	8 "
Tap water (10 cc.)	58 "	66 "
Sterile tube (4 drops)	2 "	6 "

The question might be raised as to what effect the nutrient material of the broth cultures had in maintaining viability of the streptococci. To arrive at an answer to this question nutrient free suspensions of the bacteria were used in repeating the above work. The results obtained are presented in table 2.

Table 2. Period of viability of *alpha, beta* and *gamma* types of streptococci of mastitis when two cubic centimeters of nutrient free suspension was used to inoculate the various materials under study.

	First Trial	*Second Trial*
Sand (10 gm.)	66 days	60 days
Soil (10 gm.)	8 "	10 "
Burlap sacking	8 "	8 "
Tap water (10 cc.)	66 "	65 "
Sterile tube (4 drops)	8 "	8 "

As before similar results were obtained in the case of the three blood agar types of streptococci. The results are, therefore, given collectively in table 2. The data presented indicate that the presence or absence of nutrient materials had no influence on the length of time during which the organisms remained viable.

As previously mentioned part of the work reported by Cameron was repeated to check the writer's technique. These results are presented in table 3.

Table 3. Period of viability of *Brucella suis* when two cubic centimeters of broth culture were used to inoculate the various materials under study. The results reported by Cameron are given for the sake of comparison.

	Writer	*Cameron*
Sand	122 days	.....
Soil	46 "	37 days
Burlap sacking	9 "	5 "
Tap water	81 "	77 "
Sterile tube	131 "	121 "

The data presented in table 3 confirm the work of Cameron and permit some comparison of these results with those reported for the streptococci of mastitis.

Seelman and Siemonsen[2], Schmidt-Hoensdorf and Schmidt[3], Seelman[4], Klimmer and Haupt[5], Frost and Hadley[6], and Miller[7] have demonstrated that infectious mastitis can be induced experimentally by placing suspensions of streptococci into the teat, or by milking with hands wetted with streptococcus-infected milk, or by stabling normal cows on infected straw. If the infection can be experimentally produced with such ease it is not unreasonable to suppose that the infection follows such channels with the same ease in its natural spread. The data presented in this report give us more definite knowledge concerning the potential danger in permitting streptococcus-infected cows to

remain in a susceptible herd. It also gives us some information as to the period of time that must elapse, after eliminating the streptococcus-infected cows to guard against contaminated materials, being possible sources of infection. The writer[8] has previously reported on the streptocci contamination of dairy barns, which gives some idea as to the situation found in dairy barns housing infected cows.

Summary

1. *Alpha, beta* and *gamma* types of streptococci of mastitis manifested similar resistance to the devitalizing factors to which they were subjected.

2. Streptococci of mastitis remained viable for:

(a) Sixty-six days in sand when inoculated with broth culture and 66 days when inoculated with nutrient free suspension.

(b) Eight days in soil when inoculated with broth culture and 10 days when inoculated with nutrient free suspension.

(c) Eight days in burlap sacking when inoculated with broth culture and 8 days when inoculated with nutrient free suspension.

(d) Sixty-six days in tap water when inoculated with broth culture and 65 days when inoculated with nutrient free suspension.

(e) Eight days in sterile tubes (4 drops) when inoculated with broth culture and 5 days when inoculated with nutrient free suspension.

3. *Brucella suis* remained viable for:

(a) One hundred and twenty days in sand.

(b) Forty-six days in soil.

(c) Five days in burlap sacking.

(d) Seventy-seven days in tap water.

(e) One hundred twenty-one days when four drops were dried in sterile tubes.

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[8]Bryan, C. S. Streptococci Contamination of Dairy Barns, VET. MED. 29, No. 9, pages 384 to 387, 1934.

* * * *

Plague

Returning Crusaders brought the Black Death to England in their wake. In 1348 one-fourth the population succumbed to its dreadful ravages. It struck swiftly. One day a patient would be in his usual health; within a few hours he would be consumed with a burning fever and show marked swelling of the lymphatic glands. Often within twelve hours, or at the longest three days, the patient was dead.

It is no wonder the population was terror-stricken. Dwellers in cities and towns, if able, rushed to the country.

If a member of a family were stricken, the infected house was barricaded and a sign placed on the door: "Lord, have mercy on us." Carts rumbled along the streets, the drivers calling out, "Bring out your dead," whereat dead bodies were hastily handed out of the lower doors or passed from an upper window to the waiting improvised hearses. The remains were taken to great pits, thrown in pell-mell and covered.

Streets were deserted, shops closed, and houses stank with the unnursed dying and dead. All dogs, as nearly as possible, were killed, but this only increased the danger, for the hungry rats fed on the dead carcasses, propagated tremendously and spread the plague.—*The Bloodless Phlebotomist.*

Mastitis Control in the New York City Milk Shed

By J. F. McCARTHY
Courtland, New York

MASTITIS probably causes a greater loss to the dairyman than any other disease affecting dairy cattle. The progressive milk producer realizes that this condition prevailing in his herd lessens the amount of his milk check considerably and in consequence makes every effort to remove it. No rules or laws are necessary to compel a dairyman of this type to check the condition of his cow's udders. The dedecrease in his milk check caused by a high bacterial count soon calls his attention to the seriousness of this condition. Unfortunately all dairymen are not of the progressive type. A record sheet showing the production of each animal in the herd is seldom seen in the majority of dairy farms in New York State. The producer is unable to tell which cows are good producers and which are boarders in his herd. For this type of producer laws must be formulated and rules and regulations rigidly enforced to clean his herd from disease.

Many have been drawn into the tuberculosis eradication campaign because their immediate losses from removal of milking animals from their herds are absorbed by the state. Mastitis eradication presents a different picture to the owner. If he loses the use of a cow or a number of cows from his milking herd he alone must bear the cost. Convincing the intelligent and progressive owner that he is really saving money by removing these disease-ridden, low-producing and bacteria-spreading animals from his herd is an easy matter. Convincing the inefficient dairyman of this same plainly-visible fact is next to impossible. Nothing but the cost of the condemned animal enters his mind. The damage inflicted on the healthy members of the milking line by these infected cows doesn't register in his mind with the initial loss of the animal itself. After being forced to dispose of cows contaminated with infected udders and watching his milk check increase, not only from the addition of low bacteria count premiums but also from an increased quantity of his milk, this same grumbler and dissenter will agree that the disposal of those animals was the best thing that had ever happened to his herd.

Many arguments have occurred in the past between the practicing veterinarian, who makes the annual examination of dairy herds for the milk-marketing companies and the New York City Board of Health and their representatives sent upstate to check the work of these private veterinary examiners. The greatest difficulty seemed to be that no rules had been made that stated the exact condition an udder must be in to cause the condemnation of the animal for further milking purposes. Many veterinarians were removed from the list of eligibles permitted to examine dairies because they permitted cows to remain in the milking line that were removed by the city Board of Health representative in his check-up examination. Much ill feeling followed, and finally a demonstration was organized and carried out at Cortland, N. Y., by Dr. D. H. Udall at the request of the New York City Board of Health. Dr. J. L. McAuliff chose the animals to be used from reactors to the tuberculin test which were furnished by the state.

Veterinarians from all sections of the

state arrived to try their hand at placing these animals in their proper classification of infected or non-infected individuals. Doctor Udall's classification as outlined in his book "The Practice of Veterinary Medicine" was decided on as the official standard in classifying the animals. Many and varied were the findings reported by individuals making the examinations, showing clearly that many had little conception of the lesions of mastitis. The results obtained from this test clearly indicated that some standard of classification must be adopted. All were instructed to learn well the Udall method of classification, and given a copy of the segregation and condemnation sheets formulated by the New York Board of Health for examination and criticism. A copy follows:

Animals to Be Examined

a. All milk cows. Both "in milk" and "dry."
b. Bulls in all herds *not* tuberculin tested.

Animals Exempt from Examination

a. All heifers, or animals that have *never* freshened in *all* herds.
b. Bulls in all herds that *have* been tuberculin tested.

Examination of Dry Cows and Additions

All dry cows at pasture at time of regular examination must be examined before January first, of the following year, and reported on regular Veterinarian's Certificate. All additional animals not exempt from examination added to herd unless accompanied by Veterinarian's Certificate showing examination made within 30 days prior to purchase must be examined and a certificate filed at the milk-receiving station before milk can be included in the shipment. Such examination, in all cases, must be made not later than two weeks after the arrival on the farm. This examination must be reported on "individual cow certificate forms" which includes a purchase statement to be signed by the dairyman. If certificate accompanies animal, a purchase statement on the certificate must be signed by the dairyman.

Disposition of Unsound Animals

Any animal found, upon examination to be suffering from any condition which, in the opinion of the veterinarian, makes it unfit to produce milk for human consumption, or to remain in line with milk cows, must be segregated immediately from the rest of the herd and the milk withheld from shipment. All such animals must be recorded by the veterinarian as either "condemned" in cases of permanent unfitness, or "held for re-examination" in those cases where, in the opinion of the veterinarian, the condition causing unfitness is of a temporary nature. In either case the veterinarian must notify the dairymen to make immediate segregation. A statement signed by the dairyman showing segregation on the same day of examination must be made on a regular form to be used for such purpose. There must be a separate statement including description for each animal, which must be filed, *by the veterinarian*, with the regular herd certificate, at the milk receiving station. All animals recorded by the veterinarian as "condemned" must be removed from the farm within fourteen days after day of examination. The disposal statement must be placed on file at the milk-receiving plant not later than the eighteenth day from day of examination, otherwise *the milk supply from the entire dairy shall be excluded until such time as a satisfactory statement has been filed.*

All animals recorded by the veterinarian as "held for re-examination" may be kept on the farm (under segregation) and, without further veterinary examination, for a period not to exceed sixty days. At the termination of the sixty-day period, providing recovery has not taken place in the meantime as determined by a veterinarian, such animals become automatically condemned and must be disposed of within the succeeding fourteen days.

In the case of a *valuable pure-bred animal* that the owner wishes to keep for breeding purposes only, upon recommendation by the *veterinarian*, and *after investigation and approval by the Official Departmental Inspector*, the animal may be permitted to remain on the farm (under proper segregation) for a period of one year or until the next regular herd examination. Further extension of time for such an animal to be kept on the farm can be granted only upon a second recommendation by the veterinarian on a reinvestigation and reapproval by the Official Departmental Inspector. All recommendations and approvals in such cases must be in writing and placed on file at the milk-receiving station with the veterinary certificate. All such animals must be ear-tagged and tag number properly recorded.

Cattle Dealer Dairies

This class includes all dairies on farms where the practice of buying and selling cattle constitutes a definite business project, apart from the fundamental business of producing and selling milk. All such dairies must comply with the following requirements:

In addition to the regular herd certificate, every animal not exempt from examination must be recorded on a "Veterinarian's Individual Certificate Form" showing a complete description for identification purposes. In connection with the *regular herd examination*, purchase statements on "Veterinarian's Individual Certificate Forms" need not be signed, but such statements must be signed in connection with arrival of all additional cows and bulls on the farm.

All "additional" cows received on the farm, not accompanied by satisfactory veterinary certificate, must be kept segregated and milk withheld from shipment until an examination has been made by a veterinarian and all necessary records filed at the milk receiving station.

No animal that has ever been condemned by any veterinarian, and no animal that has ever been

recorded as held for examination without having been re-examined and pronounced sound, and no animal suffering from any abnormal condition known to the owner which might make the milk unfit for human consumption shall be brought on to the farm.

This program, if carried out to the extent which is now being demanded by the New York City Board of Health, will materially improve the health conditions in most of New York State dairies. Mastitis will most surely be removed from its present position as the greatest economical loss to the dairyman. Great storms of protest will probably be raised by rigid enforcement of these rulings, but in the final analysis those protesting the loudest will undoubtedly be the ones to profit most through the compulsory weeding out of diseased animals from their herds. Possibly because of the present milk surplus the authorities seem inclined to enforce the regulations very strictly.

* * * *

"Seedy Belly"

The term "seedy belly" is loosely used to mean off color of the belly-fat. When the patches of off-color branch like the structure of the gland and are dark, this is called black seed. It is caused by coloring matter which has the same origin as the black pigment in the skin and hair. It is for this reason that black seed is found only in black and red hogs which have black pigment in the skin, and not in white breeds. A reddish discoloration of the gland is known as red seed. The red seed is due to congestion of blood in the gland and is not ordinary pigment. The mammary gland may have black seed or red seed alone, or the two may be together. The total annual loss to the packing industry from seedy belly amounts to roughly ten million dollars. Seedy cut and the losses it causes may be prevented by the use of white breeds of swine for bacon production, and by the slaughter of gilts of an early age (and lighter weight), before they have reached sexual maturity, or by spaying the gilts at an early age.—Univ. of Wis. Cir. No. 262.

Treatment for Chorea

Mutch[93] believes that calcium acetylsalicylic acid (calcium aspirin) possesses the means of dealing simultaneously with the three etiologic factors of chorea: rheumatism, nervous strain and calcium deficiency. It supplies an adequate amount of calcium, produces a useful sedative effect on the brain, and combats the rheumatic element if given in appropriate doses. It dissolves readily in water (1 gm. dissolves in 5cc.) and forms a neutral solution suitable for administration by vein or subcutaneously, as well as by mouth. By crystallization from a solution of calcium chloride a form of calcium acetylsalicylic acid is obtained with a stability approximately equal to that of the parent acetylsalicylic acid itself. The author's nineteen patients were kept in bed. A light, mixed diet was given. The only drug employed (exclusive of aperients) was calcium acetylsalicylic acid (Coplans), dissolved in water and administered by mouth. The average daily dose varied up to 45 grains (3 gm.) for a child 12 years of age. The rapidity of response did not vary accurately with the original severity of the choreic movements; mild cases sometimes proved more resistant than severe ones. The attack was not registered as over until the condition had so far improved that an average medical man would have had difficulty in diagnosing the case as one of chorea. Spontaneous movements had ceased. Voluntary movements were of average accuracy, and the patient could sustain a steady grip of the hand for a minute or more without fluctuation. The average time taken to control the chorea was seventeen days, and the limits were seven to forty-six days, respectively. The drug diminished the discomforts of the patients at all stages of treatment and did not produce any mental depression, undue drowsiness or digestive derangement.

[93]Mutch, N., Medicinal Treatment of Chorea (Calcium Aspirin), *British Medical Journal* Aug. 11, 1934. Abst. in *Journal A. M. A.* 103:14 Oct. 6, 1934.

Acetonemia in Milk Cows

The rapid advancement in the knowledge of acetonemia in cows has proved one of the greatest helps to practitioners not only in this country but in others. It has been defined as: "a parturient disease of mature cows characterized by a hypoglycemia, acetonuria, and acetonemia." Research on the subject is still in progress. The exact cause of acetonemia is unknown. It is thought to be due to deranged metabolism. The theory being that the carbohydrates are reduced to such a degree that complete oxidation of the fats cannot be carried to the final state of carbon dioxide and water. The fats are not carried beyond the stage of aceto-acetic acid and beta-oxybutyric acid. These are thrown into the blood stream and cause symptoms of acetonemia to appear within eight to ten days after parturition or even later. The lowering in the amount of carbohydrates is thought to be due to accelerated milk production. This has by many been advanced as one of the causes of acetonemia. Another theory advanced is that one of the autonomic nervous centers that control metabolism may be affected.

The symptoms in this condition are relatively constant in each case. They are very similar to the symptoms of milk fever. In from one to several weeks after parturition there is a gradual loss of appetite and a rapid loss of condition. This rapid loss of condition is explained by an increase in the metabolism of proteins resulting from an impaired combustion of carbohydrates and reduced fuel value of the fats. In some cases the onset is sudden and the course is marked by severe nervous symptoms, such as fear, excitement, involuntary movements, spasms, convulsions, and paresis. In a typical form the cow stands with the back arched, the head lowered and the eyes closed. She is reluctant to move or moves slowly. The course is somewhat like that of milk fever with a tendency to alternate with improvement and relapse. The eyes may have a wild or staring expression. The pulse is normal except in unusually severe attacks and complications. In mild forms respirations may be shallow and slow. Respirations in typical severe cases is labored and deep with marked activity of the abdominal muscles. The heart beat is usually normal as is also the temperature. There is an impaired appetite with a preference for filthy bedding. There is an absence of contractions of the rumen and peristalsis. Rumination is slow and infrequent. The feces are dry and shiny or they may be covered with mucous. At times the liver shows an increase in size and pain on percussion. Nervous symptoms are present in all cases to some extent and they may be very prominent. The peculiar standing attitude with arched back, lowered head, and half closed eyes is the result of a profound mental depression. When the animal is lying down the position may be identical to that of milk fever. One may see almost any type of nervous symptoms. Examination of the urine reveals a marked increase of ketone bodies (acetone bodies) up to 1,250mg per 100cc of urine, as compared with the normal of seven milligrams. There is a similar increase of acetone in the blood where the normal is approximately 3mg per cent.

The course of the disease depends upon the severity of the attack. In mild forms recovery is complete within a few hours. The symptoms may persist for several days and recurrence after apparent recovery is not unusual. According to Hudson, proper treatment results in recovery in about three days. Deaths seldom occur in this condition.

The differential diagnosis between milk fever and acetonemia may be difficult except in typical cases. There are various ways by means of which acetonemia may be diagnosed. One way is that acetonemia should be suspected when the onset is not closely related in time to parturition. We may also suspect this condition when a suspected milk fever case does not respond promptly to inflation of the udder or of the administration of calcium

gluconate and also when improvement is followed by a recurrence of the attacks. Examination of the urine according to the method introduced by Dr. Hayden will indicate the presence of acetonemia in cattle. This is a very important test as it can be used in the field as well as in the laboratory. The reagents consist of a mixture of one part of powdered sodium nitroprusside with one hundred parts of chemically pure ammonium sulphate and a separate solution of concentrated ammonium hydroxide. One gram of the nitroprusside-sulphate mixture is dissolved in five cubic centimeters of the suspected urine, then two cubic centimeters of the ammonium hydroxide solution are added and the contents of the tube mixed. A positive reaction is indicated by the appearance of a permanganate color, thus indicating the presence of acetone bodies. The color becomes more intense in five to twenty minutes. The permanganate color is pronounced even in mild cases but becomes more intense with the increase in severity of the acetonemia.

The treatment for acetonemia is varied, although best results have been obtained through the use of 250 grams of dextrose intravenously in a 20 to 50 per cent aqueous solution. Others use small amounts of glucose given frequently. In addition to the above treatment, chronic cases may receive sugar or molasses with the feed. The use of glucose or sugar provides carbohydrates for the combustion of the ketone bodies and this in turn reduces the combustion of the tissue proteins and fats. Calcium gluconate and inflation of the udder may be added where a complication of milk fever is suspected. In some cases the use of chloral hydrate brings about a recovery; the modus operandi of its action is not understood.

Through the advancement in the knowledge concerning this disease, a problem confronting veterinarians throughout the country has been solved. A practitioner is now able to diagnose and treat successfully a condition that heretofore was known as a stubborn case of atypical milk fever, the treatment of which was inadequate and unsatisfactory.

Mario Cerosaletti.

Port Washington, N. Y.

* * * *

Intussusception in the Dog

Intussusception in the dog is of rare occurrence. In the bovine it is the most common form of acute obstruction; while in the horse it is seen quite frequently. The few cases of intussusception that do occur in the dog are seldom diagnosed except at autopsy.

The etiology of this acute obstruction is not fully understood. Some regard it as due to an unequal loading of the bowel; some that it is due to a violent, irregular peristalsis, and others have found it due to a tumor or some fibrous growth in the lumen of the intestine. In every case, however, there is a telescoping of a section of the bowel into a section immediately behind it.

A case of intussusception was observed in a six-months-old black-and-white, male, Boston Terrier, October 12, 1933. This puppy had been wormed frequently from the time of weaning. Two days previous to my call he had been given a proprietary vermifuge followed by castor oil. As no feces or worms were passed, the castor oil was repeated the next day with similar results. The dog showed symptoms of colic and was in continual pain throughout that day and night. He had no appetite and vomited whenever anything was forced upon him. No more feces were passed, nor could they be obtained by an enema.

When I saw the dog the colicy symptoms had subsided, but he was greatly depressed. The pulse was weak and thready; the temperature normal. Upon palpation of the abdomen a firm object about one and one-half inches long and one-half inch in diameter was felt in the intestine. Pressure upon the object caused pain; upon manipulation it would slip through the fingers. It felt blunt at one end and pointed at the other. A diagnosis for intussusception was made.

A laporatomy was performed in the same manner and with the usual precautions observed in spaying. Upon opening the abdo-

men the intussusception proved to be of the cecum into the large colon, completely closing the opening from the ileum. Adhesions had taken place between the inverted visceral peritoneum, so that it could not be worked back into the normal position. The end of the colon was securely closed with a continuous Lembert suture of catgut. Then a longitudinal incision about one-half inch long was made through the walls of the colon over the invaginated cecum. Through this small opening the cecum was then cut off with the scissors, thus removing the obstruction to the opening of the ileum into the colon. The incision in the colon was closed by two rows of continuous sutures of catgut, the first row including all three coats of the intestinal wall, and the second row of the Lembert type. Due to the weakened condition of the dog very little ether was necessary to produce anesthesia for the operation.

Following the operation the condition of the patient soon became alarming. Fifteen minims of a 1:1000 adrenalin chloride solution was given subcutaneously, an enema of physiological salt solution administered, and heat by means of hot water bottles was applied to the body in an attempt to revive the dog.

The pulse remained weak, and soon became imperceptible. All efforts to revive the dog were futile, and he died about three hours after the operation. No worms could be found in the intestines upon autopsy.

In my experience nearly every case of intussusception has had a history of recent worming or of constipation. I think it advisable for the practitioner to pay little attention to the owner's diagnosis of a sick dog, but to make his own diagnosis by the symptoms shown by the animal, by palpation of the abdomen, or by the use of X-ray machine. Once a positive diagnosis of intussusception has been made an immediate operation is the only alternative. The prognosis should be guarded in every case of intussusception.

Lloyd D. Barnes.

Laceyville, Pa.

Pyometra in Bitches

By RAPHAEL MEISELS
Hunter, New York

PYOMETRA is a collection of purulent material, varying from thick, creamy pus to sero-sanguinous exudate in the uterus. In exceptional cases the uterine contents may be clear, watery fluid. When infection gains extrance at time of whelping, or if a latent infection becomes active and causes an acute inflammation, we call the condition metritis. Pyometra is a chronic condition.

It is difficult to say just how prevalent this condition is in a general practice. The statistics of the Small Animal Clinic, New York State Veterinary College, reveals that it may occur more frequently than is generally supposed. Pyometra constitutes nine percent of the genital disease treated in the clinic. Ithaca has very few canine breeding establishments, and this would lead one to expect pyometra to be even more common where dog breeding is carried on extensively.

Pyometra is to be differentiated from metritis, which is a more acute inflammation—a common sequel of abortion or parturition. Metritis becomes pyometra when the uterus is sealed up and the pus is dammed back. Chronic metritis accompanied by a discharge through the vagina and vulva may lead to pyometra at any time. It must always be borne in mind that the cervix may become thick enough as a result of the inflammation to completely close the uterus.

The symptoms are indefinite and commonly fail to point to the uterus as the diseased organ. In a few cases there may be a history which shows that there had been a slight reddish discharge from the vulva. In the majority of cases there has been no discharge. Occasional vomiting is the first symptom noticed by the owner. There is a gradual loss of appetite. The bitch loses strength, becomes thin, is dull and is able to retain but little food. The temperature is not high, and it may even be normal or below normal. Near the end

the bitch may become comatose and the temperature subnormal. Some bitches may have a history of poor health and two or three attacks of vomiting, recovery from each attack taking place after the discharge of a small amount of pus through the vulva. The vomiting is due to the diseased uterus and not to gastritis.

Pyometra is found only in bitches that have passed through at least one period of estrum. The breeding history is of great importance in making a diagnosis. In most cases the bitch has been breed, either intentionally or accidentally, and failed to conceive. After a period of weeks or months the physical condition of the bitch become affected.

Physical examination reveals an animal in poor condition. The abdomen may be enlarged, and if looked at from above it may appear slightly pear shaped, the lower portion being distended. The presence of fluid can not be demonstrated as usual because ballotment does not cause an undulating wave through the abdomen. That the uterus is the affected organ may be determined by the size and location of the swelling within the abdomen, and by feeling for the bifurcation, which is found readily in the majority of cases. In some cases the uterus may be so distended that it can not be recognized as such except for the fact that the distended organ felt is on the floor of the abdomen, and also because there is no decrease in size after catheterization.

The diagnosis depends on the symptoms, history and examination. Vomiting is very significant, and in addition to the facts found on examination should tell whether the uterus is involved or not. If there is continual or intermittent discharge of the purulent material from the vagina, diagnosis becomes much easier. The history of the case when available is very important.

The treatment depends on whether or not the cervix is open. If the cervix is open, irrigation, using a return flow tube, is the procedure to employ. Any of the various antiseptic solutions that are tolerated by the uterus and vagina may be used with impunity. It is reported by some that this treatment is successful but such has not proved to be the case in the Small Animal Clinic of the New York State Veterinary College. If the cervix is closed as a result of the inflammation, it is doubtful whether irrigation will clean up the infection. In all probability the bitch is hopelessly sterile.

In those cases where the cervix is closed hystero-ovariectomy is the only practical procedure. This operation is similar to the spaying operation. The danger of infection and hemorrhage is greatly increased. The body of the uterus should be ligated in two places to prevent the contents from draining in the peritoneal cavity. The stump should be cauterized with phenol and neutralized with alcohol. The peritoneal cavity may be disinfected with ether. A drainage tube should be used in those cases where the uterus is ruptured, or some of the uterine contents escaped into the peritoneal cavity as a result of faulty technique.

The prognosis depends on the physical condition of the animal. These cases of closed cerivices present a very grave prognosis. Removal of the uterus and ovaries should be followed by recovery of the patient except when the complications of peritonitis set in.

A Case with Ruptured Uterus

An eight-year-old English setter bitch was bred two weeks prior to entering the clinic, and had been bleeding profusely ever since the mating. On the day of entry there was a copious sanguinous discharge from the vulva. Physical examination was negative. The temperature was 102°F.

The body of the uterus and vagina were irrigated with a boric acid solution for the first two days. On the third day the bitch went off feed, was very depressed and there was a slight increase in the temperature. A laporotomy was

performed. Upon opening the peritoneal cavity the body and both horns of the uterus were filled with a bloody, mucoperulent material. There were several places where the uterus was ruptured. The ovaries and the uterus were removed. The peritoneal cavity was thoroughly washed with a warm sterile saline solution and a half ounce of ether was placed in the cavity before it was sutured.

An abdominal drain was inserted through the incision. Two hundred cubic centimeters of physiological saline was administered subcutaneously late that day and twice on the day following the operation. The dog made an uneventful recovery and was discharged from the clinic twelve days after entry.

' ' ' '

Canine Hysteria

Canine hysteria is one of the most baffling disturbances with which the small animal practitioner has to deal. It has a tendency to appear epizootically, but there is insufficient data to justify the conclusion that it is communicable. This peculiar condition was first described in our Southern states in 1918 and has since extended to every part of the country. The same or a similar condition appeared in England in 1924 and since that time has become a serious problem in that country. Sometimes the condition is referred to as "fright disease," but it is usually called a fit or a convulsion. In England it is commonly called canine hysteria.

A convulsion may be defined as an involuntary contraction of a muscle or group of muscles accompanied by a general nervous disturbance, often by unconsciousness. This condition is more common in young than in adult animals and in small than in large breeds. The same grade of intoxication or irritation in a young animal will cause a more acute reaction than it will in an adult. Frequently a convulsion will replace a chill in infectious fevers so commonly seen in pups.

After extensive experimental work, Saltman reported that the irritability of the motor neurons of the new-born is negative and that of the sensory neurons very low; a short time after birth, however, both varieties develop beyond a normal irritability and reach an electrical hyperirritability above that seen in adults. Saltman also reached the conclusion that the cerebral motor area is undeveloped at birth and does not react to electrical stimuli, that the reflex inhibitory centres are lacking at birth, and that the development of the inhibitory function does not keep pace with that of the motor function and peripheral irritability.

There is also a certain volitional motor control in older animals that is poorly developed in puppies, consequently the untrained nervous system of the young is more easily thrown off balance than that of the adult. Briefly, there is a lack of balance between the excitant and inhibitory forces of young animals which becomes better regulated with age.

The definite cause of the condition is unknown, but predisposing causes are many and varied. Holt states that any disturbance of nutrition such as exhaustion, anemia, malnutrition, debility, or any acute disease, especially of the digestive tract, may *predispose* to convulsions. Rickets is believed to be an important factor, and Holt states that convulsions may be the first symptoms of rickets in children. Convulsions in rickety pigs are frequent and often fatal.

Endocrine dysfunction, especially that of the thymus and thyroid, is possibly a factor, and although sufficient proof is lacking, some claim gratifying results from the use of thyroid extract.

Parasitic otorrhea is frequently given as the cause of convulsions in cats and occasionally in dogs. In France the condition is called "contagious epilepsy." In describing the symptoms of parasitic canker of the ear, Cadiot says, "In a number of individual convulsions, signs of auricular giddiness and epileptiform crisis are observed at different intervals. At first these accidental reflexes appear only occasionally as when the sick dog is excited by running or during the hunt. The

dogs appear sly, uneasy, anxious, rush straight ahead, groan, cry and fall prey to convulsions. These crises occur at intervals of several weeks and finally become more and more frequent. Some of the affected dogs become timorous and apathetic, while others become morose and aggressive. Frequently the animals lose consciousness and occasionally death occurs. Such severe symptoms have not been reported in this country."

Digestive disturbances are common in young animals and many so-called convulsions respond to the use of laxatives and a change of diet.

Intestinal parasitism, dentition, overexertion and phymosis have all been involved as causes of convulsions, and H. D. Walston of King's College, Cambridge, stated that in his opinion canine hysteria is connected with a deficiency of the anti-infective vitamin A associated with a relatively large consumption of vitamin E found abundantly in dog biscuit and some cereals. Whatever the cause may be, the condition is a serious and baffling one. That many sudden, unexplained deaths in dogs are due to convulsions is probable, but proof is lacking.

The care of a case must include emergency treatment of the convulsion and the removal of the cause when this can be determined. Sedatives are indicated immediately and a thorough examination advised. Microscopic examination of fecal and auricular discharges should be a routine procedure. The presence of parasites demands radical treatment. Where a definite cause is not apparent, laxatives and change of diet are indicated.

When asked to comment upon the condition, Professor G. H. Woolridge, of the Royal Veterinary College, said, "Until very recently, we have known nothing about the cause of hysteria in dogs. Recent observations are very interesting and instructive, but I feel that a great deal more work will be necessary before anything definite is proved."

M. R. Watt.

Port Washington, N. Y.

Morphine Pentobarbital Anesthesia for Dogs

A nonvolatile anesthetic combination for dogs, which produces good surgical anesthesia and relaxation for a period of from one to two hours and assures postoperative recovery, is a distinct asset.

The short-acting barbiturates, pentobarbital and amytal, if used alone, give good anesthesia but recovery cannot be expected for from three to six hours. In addition, since these drugs are not analgesic, undesired restlessness and purposeless movement often characterize the recovery period.

We have been using a combination of morphine and pentobarbital sodium with gratifying results. The anesthetic dosage of pentobarbital sodium for the dog is from 0.025 to 0.035 gm. per kilogram intravenously. If morphine sulphate 0.01gm per kilogram and atropine sulphate 0.001 gm. per animal be given subcutnaneously one and one-half hours prior to operation, the amount of pentobarbital sodium required is reduced to 0.005 to 0.015 mg. per kilogram, depending on the length of anesthesia.

When ready for operation, we inject intravenously a 1 per cent solution of sodium pentobarbital slowly, carefully observing respiration and other criteria of anesthesia. Slow injection permits of maximal control of depth of anesthesia with minimal dosage. The minimal amount of the drug required to produce anesthesia, if given in this manner, will usually last about one to one and one-half hours. Subsequent additions of this barbiturate by the same method of slow injection will extend the period of anesthesia if desired. Precaution against respiratory arrest must be taken by using slow intravenous injection of the drug on a symptomatic basis.

Recovery is gradual (one to two hours) and is free from excitement. Pharyngeal and laryngeal reflexes return early leaving no concern as to care or ultimate result from anesthetic procedure.—H. H. Seevers, in *The Jnl. of Lab. & Clin. Med.*

Lavage and Gavage in Dog and Cat Practice

By J. GILBERT HORNING
Houston, Texas

PART 3.

Lavage

This means washing out of the stomach by copious injections and rejections of fluid with the aid of the stomach tube.

Expression is that form of lavage where copious injections are made, the tube pulled into the mouth and started back and then out and back a few times to induce vomiting. If this does not work, withdraw the tube at once, pull out the tongue and exert pressure with the index finger on the base of the tongue, at the same time having the assistant press with hands on both sides of the abdomen, inwards and forward. Failing to start vomiting by this means, aspiration is the next choice. One should always compress the tube when withdrawing and withdraw quickly, as liquid might be retained in the tube. If withdrawn slowly without compressing the tube, there might be an escape of fluid into the larnyx, probably causing choking, coughing or vomiting.

Aspiration is the form of procedure where the aspirating apparatus depends upon the case and the choice of the operator; either a tube with a two-way bulb and funnel as in Fig. 1 or a tube and a B-D syringe as in Fig. 3. Copious injections are made and in the case of tube with the funnel and hand bulb, the funnel is lowered as the last injection of fluid is made and the hand bulb rapidly pumped to start the flow outward. In the B-D syringe with tube, after the injections, the syringe bulb is pressed in, the syringe attached to the tube and the suction of the syringe bulb started and the tube lowered at the same time to create the flow of fluid outward. When started the syringe can be removed and the contents syphoned into a pan. Should a specimen be desired the syringe can be filled and then emptied in a container for further examination, or the entire fluid can be emptied into a special container for examination.

IN DOG practice lavage is used less than gavage. However, when indicated it is a valuable procedure. Due to the fact that our canine patients commonly swallow such large pieces of foodstuff, withdrawing the stomach contents through the tube may be, and frequently is, absolutely impossible. The use of emetics (apomorphine hydrochloride, preferably) for this purpose is far more satisfactory. In cases where emetics are contraindicated, lavage by expression may be tried, and if this fails resort may be had to aspiration.

In extremely weakened cases of distemper in the second stage, where the animal swallows much nasal discharge and mucous, washing the stomach with a 1 per cent bicarbonate of soda solution is of decided help. In hemorrhage of the stomach or duodenum, washing with ice water to which adrenalin solution has been added will give beneficial results in certain cases. In acute vomiting cases, washing once daily with boiled water for four or five days, accompanied by feeding of foods suitable to the digestive capacity gives splendid results. Should unsuitable feedings be continued, however, the lavage will be of little benefit.

In washing the stomach copious injections should be made, syphoned off or rejected by natural vomiting and repeated until the rejected fluid is clear. Should the condition of the patient not warrant this procedure, several injections and rejections will suffice. Cases of indifferent appetite, and limited food

capacity without vomiting are greatly benefited by this treatment. In such cases stomach washing once a day will be followed by a surprising improvement, showing that there may be stomach disorders of considerable importance without vomiting, the only symptom being loss of appetite and malnutrition. Gastric atony may be a functional gastric disorder or if severe show symptoms attributable to the motor insufficiency of the organ. The usual symptoms are distress following the taking of food, later vomiting, which may be occasional or only after eating. Lavage relieves these cases for a variable period.

Wherever stasis or food residue occurs lavage given at night for several days is of great value. In some of these cases there is a large quantity of vomitus of decomposing food. Nightly lavage with rest of the stomach for 12 or more hours (in some cases 24 to 48 hours), and allow to drink only a small amount of boiled water—this at regular intervals, the amount depending upon its reception by the stomach and the size of the patient, is the only treatment needed. The rest period must, of course, be followed by foods suited to the condition of the patient. Should a laxative be needed, orange juice and milk of magnesia, equal parts, administered by tube in the morning, give best results.

In strychnine poisoning, give a dose of pento-barbital sodium hypodermically and after the dog relaxes, give through the stomach tube a teaspoonful of tanic acid, dissolved in six ounces of water.

THE question has been raised as to the contraindications for the passage of the stomach tube. Matters of this nature depend upon the judgment of the operator. I know of no case in which the passage of the tube would be contraindicated. In cases that are extremely weak, not drastic, but mild lavage and several hours later gavage should be employed. The skill of the operator naturally depends upon his judgment gained through study and experience.

Gavage

Gavage is feeding and medication via the stomach tube. The technique for passage of the tube is the same as for lavage. Moisten the tube with water, pass it and after administering whatever is to be given, the tube should be compressed and quickly withdrawn.

Patients that cannot retain a teaspoonful of water administered by mouth will retain a half-ounce or more when it is given by the tube. Gavage can be employed every four hours; feeding at first, half the quantity given in health, gradually increasing as the patient's condition justifies it.

Gavage from the fact that it can be used to feed and medicate the patients is naturally used in our work more than lavage. Liquid medicines that the animal ordinarily would fight if administered by mouth may be given with ease by tube. Other solutions that from their volume when given by mouth become a tiresome and sloppy procedure, when administered by tube are given with neatness and dispatch. Any liquids will start some dogs to slobbering, so much as to render it almost impossible to get the medicine down in any considerable amount, the dogs in the meantime soiling their foreparts. Cases of this type can be corrected by administering the medicine through the tube.

In severe cases such as pneumonia, grave gastrointestinal conditions, etc., gavage may save the life of the patient. In nearly all these cases where insufficient nourishment is taken to support

life, gavage may be employed every four or five hours, or at least three times a day for several days, until the patient becomes strong enough to desire to eat voluntarily.

Foods to Be Administered by the Stomach Tube

This varies, depending upon the case and animal, the cat requiring different foods than the dog.

For dogs:

Sweet Milk and Karo Syrup Mixture.—Pasteurized sweet milk and white karo syrup in the proportions of one part of white karo syrup to ten parts of milk, is one of the best food combinations. Depending upon the case the milk is given, cold, warm, scalded or boiled.

Dr. Carl F. Schlotthauer of the Mayo Foundation, Rochester, Minnesota, aptly stated the advantages of this mixture in a personal communication:

"We use the stomach tube to feed milk and karo syrup to all sick and debilitated dogs that refuse to drink of their own accord. We feed the milk and syrup mixture to many dogs that have bowel operations. It is our old reliable standby to build up any dog that loses flesh."

As an alternate feed, use:

Nutritive Liquid Peptone Mixture.—Nutritive liquid peptone one part, distilled water three or four parts, may be used as an alternate feed once a day or in cases not receptive to milk in any form or manner it may be given with advantage as often as three times a day. Some cases require a slightly greater dilution than that stated. When feeding this we keep a small bottle of peptone and a bottle of distilled water in the refrigerator, mix at the time it is administered.

Farina Mixture.—Farina in another alternate for the milk-karo mixture. To two cups of hot milk add one-fourth of a cup of farina cereal, stir and cook for five minutes, strain through a sack and add enough scalded sweet milk to make into a mixture that can be poured through the stomach tube.

Corn Starch Mixture.—To a cup of scalded or boiled sweet milk add Argo corn starch as much as desired—usually one to two tablespoonsful; stir and pour into the tube warm. White karo syrup can be added to this and also the farina mixture and in some cases beaten egg white.

For nursing puppies and kittens:

Carnation Milk Mixture. — Carnation Milk one part, boiled water three parts, to each 8 ounces of this mixture add three teaspoonfuls of white karo syrup. As the pups and kittens become older the amount of water should be decreased until they are being given one part Carnation Milk and two parts water at lapping time. Pups and kittens may be fed with the tube, more easily and more rapidly than with a bottle. They take the tube readily.

For Cats:

Carnation Milk Mixture. — Carnation Milk one part, water two parts and gradually decreasing to equal parts, and in some cases giving the straight Carnation Milk from the can. This mixture is for large kittens and mature cats.

Peptonized Milk—Cold Process Method.—Put one-half a tea cup full of cold water and half the powder contained in a peptonizing tube (Fairchild) into a clean, pint milk bottle and shake thoroughly; add a half pint of cold fresh milk and shake again and place the bottle immediately directly in contact with ice. In making this I always use Fairchild Bros. and Foster's peptonizing tubes. Always shake the bottle well before and after pouring out a portion.

Feed the peptonized milk to cats by the tube two or three times a day, one to two ounces at a feeding for full-grown cats; less for the young and in a few days they will eat voluntarily.

The mixtures described are sufficient to get along with, they are tried and proved, not elaborate or costly and are easily prepared. The proportions given in all formulas are about the average found desirable. They may be changed as necessary.

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AUTHOR'S INDEX

A

Adan, C. L., 337
Albrecht, A., 484, 486
Alston, J. T., 379
Amadon, R. S., 305
Anderes, R. L., 331
Arnold, L., 345
August, H. M., 403

B

Baker, E. T., 60, 208, 319, 510
Barnes, Lloyd D., 531
Barret, L. D., 23
Bart, A., 345
Bartholomees, Geo. E., 462
Baumann, R., 303, 347
Beach, B. A., 9
Becker, Bob, 225
Beeman, H. N., 34
Behnke, A. E., 444
Bergman, H. D., 150
Bergsten, Marcus L., 296
Bisanti, Carlo, 420
Bivin, Geo. D., 261
Blair, Addison, 323
Blamey, Edwin R., 198
Boehm, S., 441
Bolle, W., 347
Bolton, T. L., 30
Boughton, Donald C., 5
Bower, Chas. W., 194
Bram, Israel, 351
Bridges, B. F., 260
Brown, H. L., 201, 216, 286
Bruhn, W., 402
Bryan, C. S., 384, 524
Busby, Martin J., 290

C

Cadeac, C., 42
Cary, C. A., 224
Catlett, J. G., 271
Cerosaletti, Mario, 530
Chandler, W. L., 188
Chleboun, Paul E., 293
Clawson, A. B., 484
Coale, B. B., 250
Constantinesco, G. K., 422
Cornwall, Edw. E., 225, 309, 351
Court, M. J., 443
Courtous, Bernard, 1
Covault, C. H., 104
Cox, Forrest O., 294
Csontos, I., 301

D

Davy, Humphrey, 1
Dibble, C. B., 66
Dicke, W. E., 288
Diggs, E., 41
Dinsmore, W., 207, 478, 523
Doenecke, H., 91
Doller, M. H., 21
Dryerre, Henry, 390
Dykstra, R. R., 53

E

Ender, F., 265
Engelbreth-Holm, J., 223
Evans, W. A., 517

F

Fedak, A., 264
Flexner, Simon, 5
Foote, Bernard E., 342
Forssell, G., 404, 436
Foster, Robert J., 177
Frick, E. J., 130
Fröhlich, E., 347
Frost, J. N., 202, 204, 205

G

Garbutt, R. J., 259, 478
Garrett, A. G., 65
Gatling, Richard J., 95
Gellhorn, G., 44
Glaenz, W., 264
Glenn, Samuel, 23
Glud, P., 402
Gomez, F. Donald, 326
Green, R. G., 344
Greenlee, C. W., 34
Greig, J. Russell, 430
Grubb, C. M., 461
Guillotin, Jos. Ignace, 95
Günther, K., 46

H

Hadley, F. B., 16, 83, 217
Haigler, S. W., 388
Haldane, J. B. S., 57
Hanson, Karl B., 12, 344
Hardenbergh, J. G., 6
Harshfield, G. S., 267
Hinebauch, T. D., 42
Hobbs, W. R., 110
Hoffund, S., 279
Holt, R. L., 30
Horning, J. Gilbert, 387, 438, 480, 536
Hufft, E. E., 398
Hughes, Trevor H., 472
Huntsberger, Ray, 514
Hurd, J. M., 300
Hutsam, L. R., 172
Hynes, C. P., 513

I

Ivey, W. E., 252
Iwanoff, X., 301

J

James, H. F., 41
Jármai, K., 302, 436
Jensen, R. C., 256
Jirka, Frank J., 76
Johnston, Miss Connie, 47
Jones, Erwin H., 522

K

Kaempffer, A., 47
Katter, M. S., 344
Keefer, W. O., 54, 94, 174, 216, 285, 397, 472, 520
Keith, T. B., 401
Kerr, W. J., 315
Killham, B. J., 176
Kindermann, W., 90
Kinsley, A. T., 24, 68, 94, 170, 313, 399, 400, 401, 464
Kintner, J. H., 30, 149
Klauke, E., 264
Klobouk, A., 445
Knost, A. H., 295
Koch, W., 346, 403
Koebe, K., 46
Köser, A., 301
Kotlan, A., 44, 90, 432
Kovac, F., 483
Kraus, F., 305
Krull, A. H., 290
Kueppers, F. A., 458
Küst, H., 402, 463

L

LaFond, L. H., 134
Laas, A., 301
LeDune, E. K., 276
Leiper, R. T., 188
Linch, Charles, 470
Linton, R. G., 17
Lockhart, Ashe, 136
Loessl, H., 441
Long, E. L., 289
Lörincz, F., 265
Lormore, Robert E., 474
Luckloff, Otto W., 308
Luy, P., 301
Lyon, McDowell, 187

M

McAnulty, Chas. J., 101
McCarthy, J. F., 527
McClelland, R. B., 504
McCollum, E. V., 315
McDonald, A. R., 292
McGee, L. E., 329
McKim, O. E., 247
Magens, H. J., 274, 316
Mallmann, W. L., 254
Mann, Frank C., 160
Manninger, R., 301, 433
Maternocoska, Jr., 45
Matzdorff, F., 223
Maurer, L., 403
Meisels, Raphael, 532
Merchant, W. R., 267
Merillat, L. A., 93, 374
Merriman, Clarence C., 339
Metcalfe, Elmer L., 253
Michael, L. J., 255
Milks, H. J., 101, 115, 280
Miller, C. L., 217
Mitchell, W. M., 31
Mócsy, J., 90, 221, 435
Mohler, John R., 415, 418
Morgan, R., 159, 172
Morris, C. D., 42
Müller, W., 404
Munn, M. D., 511
Murray, C. P., 518
Mutch, N., 529
Mydland, H. T., 256

N

Nachtsheim, H., 403
Natscheff, B., 46
Nelson, T. H., 296
Nichols, J. B., 321
Nichols, R. E., 452

O

Okubo, K., 46
Oppermann, Th., 91
Osler, Wm., 315
Osterholtz, H. J., 298
Oujeszky, A., 220

P

Pallaske, G., 345
Palmer, Rachel, 171
Patton, J. W., 138
Peck, Lyman, 479
Pederson, Carl S., 44
Pfrieme, F., 346
Pickett, Deets, 447
Pomeroy, B. J., 284
Portmann, K., 402
Poulsson, E., 265
Pyle, Norman J., 116

R

Ratcliffe, H. L., 345
Rae, H. Calvin, 173
Rippetoe, C. W., 320
Ritter, H., 90
Rivers, Thomas M., 313
Roberts, G. A., 68
Roby, A. A., 343
Rockwell, Alphose D., 95
Roderick, L. M., 267
Rogers, Arthur, 477
Rogers, Burton R., 506
Rolle, M., 91
Romanski, S., 484
Rothemeyer, A., 223
Rubay, P., 420
Rüegg, J., 403
Ruggles, Wm. E., 72

S

Sales, Edw. K., 129
Sawyer, H. W., 132
Saxer, E., 345
Schellner, D., 346, 483
Schermer, S., 47, 433
Schlotthauer, Carl F., 160, 502
Schmidt, W., 222, 347
Schmidt, F., 222, 279
Schröder, Hans, 266
Schulz, Carl Wm., 324
Schurnakowa, M. A., 222
Schwob, L., 305
Seevers, H. H., 535
Self, Richard A., 120
Serturner, Wilhelm, 57
Shaw, L. G., 259
Shillinger, J. E., 344
Shope, R. E., 225
Sibert, H. F., 258
Sidor, K., 483
Sigi, A., 264
Sigler, T. A., 400
Sinai, G. J., 46
Skidmore, Louis, 92
Sklar, Louise, 335
Smith, K. F., 457
Stader, Otto, 84
Stafseth, H. J., 258
Stange, C. H., 81
Stanton, J. E., 437
Steffen, Rudolph, 521
Steinach, Eugene, 2
Steinbach, F. G., 173, 216
Stevenson, D. S., 516
Stockmayer, W., 92
Struck, M., 402

T

Teeter, W. R., 376
Thissen, P., 483
Thompson, W. W., 174
Thomsen, A., 45
Thomsen, O., 223
Thomson, W. A., 291
Török, J., 404
Tyzzer, E. E., 2

U

Underwood, Paul C., 234

V

Venske, W., 223
Verge, Jean, 421
Vogt, V., 402
Volkmar, Fritz, 44, 90, 220, 264, 276, 301, 344, 402, 483
Vollstedt, W. C., 279

W

Waldman, O., 91
Watt, M. R., 534
Weber, L. P., 45
Weissmann, L., 347
Wellman, O., 435
Welsh, M., 225, 519, 523
Wendell, C. E., 341
Wharton, D. R. A., 344
Wharton, M. W., 344
Widener, Joseph E., 271
Wilkinson, M. F., 75
Wilson, J. H., 299
Wilson, M. L., 411
Wirth, D., 303
Witte, J., 44
Witter, W. F., 512
Wittmann, F., 264
Woodruff, A. D., 214
Wright, Willard H., 234

Z

Zadik, P., 222
Zepp, C. P., 416
Zschokke, W., 345

Vol. XIX Subject Index 1934

A

Abortion, Trichomonad, 44
Acetonemia of Cows, 250, 379, 474, 530
Achilles Tendon, Laceration of, 201
Actinomycotic Glossitis, 292
Alabama Short Course, 224
A. M. A., History of, 233
Ameba Lesions, 345
Amebic Dysentery of Swine, 28
Amer. Animal Hospital Ass'n, 3
Anaphylaxis, 486
Anaphylaxis in a Horse, 461
Anaphylaxis, Milk, 401
Anaplasmosis-Like Disease, 288
Anesthesia, First to Use, 187
Anesthesia in Dogs, 535
Animal Carriers of Disease, 193
Animal Dis. and Public Health, 6, 76
Animal Diseases in Man, 517
Animals, Health of, 397
Answers to Hadley's Questions, 217
Anthrax Infections in Man, 46
Anthrax in Hogs, 464
Antrum, Pus in, 281
Anus, Imperforate, 203
Arthritis in Poultry, 145
Artificial Impregnation, 304, 441
Ascarids of Dogs and Foxes, 93
Ass'n of Animal Hospitals, 3
Atresia Ani, 216
Auricular Mange, 324
A. V. M. A. Convention, 343, 425
A. V. M. A. Exhibit, 190

B

Bacteria, Viability of, 524
Bang's Disease, 347
Bang's Disease, Control of, 75, 91
Bang's Disease, Test for, 222
Bees, Poisoning in, 55
Belgium, Vet'y Conditions in, 420
Biochemistry in Practice, 390
Biochemistry in Research, 390
Biography of:
  Ascoli, Alberto, 306
  Bourgelat, Claude, 100
  Bruce, David, 231
  Doyle, T. M., 307
  Erlich, Paul, 231
  Finlay, Carlos, 231
  Foster, Robert J., 177
  Gasperi, Frederico de, 86
  Greig, J. Russell, 181
  Hinz, W., 180
  Jensen, C. O., 88, 473
  Kilborne, Fred L., 231
  Kitt, Theodor, 349
  Koch, Robert, 231
  Laveran, Alphonse, 231
  Leeuwenhoek, Anton, 231
  Loeffler, Frederick, 231
  Magnusson, Hilding G., 307
  Metchnikoff, Elie, 231
  Miessner, Herman, 306
  Milks, Howard J., 103
  Pasteur, Louis, 231
  Spallanzani, Lazzaro, 231
  Steck, F. Werner, 263
  Vial, Charles, 312
  Wolstein, John Gottlieb, 354
  Ximenéz, Rafael Muñoz, 219
  Yakimoff, W. L., 262
Bladder, Rupture of, 518
Bloat in Cattle, 208
Bloat in Sheep, 208
Blood Changes, 483
Blood Changes in Distemper, 344
Blood Examination, 452
Blood Grouping in the Horse, 47
Blood Samples, Obtaining, 265
Blood Sugar in Horses, 301
Blood Transfusion, First, 2
Bone Ash, 505
Bone Black, Spent, 515
Bone Diseases in Horses, 204
Bone Meal, Steamed, 501
Bone, Raw, 529
Book Reviews:
  America Self Contained, 233
  Beating Winter, 179
  Chow Chow, The, 179
  Coccidia and Coccidiosis of Animals, 446
  Dog's Medical Dictionary, 128
  Human Body, The, 298
  In the Zoo, 297
  Modern Medical Follies, 297
  One Hundred Million Guinea Pigs, 297
  Poultry Ailments, 447
  Practice of Veterinary Medicine, 178
  Psychology and Training of the Horse, 297
  Text-Book of Meat Inspection, 446
Bovine Laxative Formula, 209
Brucella Allergic Reaction, 45
Brucella Infection in Dogs, 45
Brucella Infection of Hogs, 92
Brucellosis of Horses, 483
Bursatti in Cattle, 301

C

Calcium and Phosphorus, 149
Calcium in Colic, 398
Calcium Therapy, 21, 398
Calcium Therapy, General, 431
Calculi, Urethral, 519
Canaries, Disease of, 146
Capillaria in Chickens, 296
Capsules, Useful, 510
Carbon Disulphide Liq. Best, 55
Catheterization of Horses, 159
Catheter, Stomach Tube, 513
Cat, Hydrothorax in, 201
Cat Practice, 323
Cats, Distemper in, 146
Cats, Echinococcus in, 265
Cats, Intestinal Flora of, 223
Cats, Lavage and Gavage in, 438, 480, 536
Cats, Mange in, 324
Cats, Ringworm in, 450
Cats, Spaying, 104
Cats, Stomach Worms in, 90
Cats, Surgery in, 194
Cattle, Acetonemia in, 250, 379, 474, 530
Cattle, Actinomycosis in, 292
Cattle, Amputation in, 339
Cattle, Angina of, 274
Cattle, Bang's Disease in, 75, 91, 222, 347
Cattle, Bloat in, 208
Cattle, Breeding, 456
Cattle, Calculi in, 214
Cattle, Cane Poisoning in, 437
Cattle, Coccidia Carriers in, 92
Cattle, Cyanide Poisoning in, 484
Cattle, Dermoids in, 256
Cattle, Dietary Deficiency, 400
Cattle, Founder in, 213
Cattle, Hem. Sep. in, 470
Cattle, Johne's Disease in, 9
Cattle, Laxative for, 209
Cattle, Lice in, 66
Cattle, Mastitis in, 84, 205, 222, 264, 279, 494, 524, 527
Cattle, Mummified Fetus in, 172
Cattle, Nephritis in, 472
Cattle, Paralysis in, 213
Cattle, Pregnancy Diagnosis in, 402
Cattle, Pruritis in, 401
Cattle, Rumenotomy in, 403
Cattle, Removal of the Eye in, 289
Cattle, Sera of, 305
Cattle, Summer Sores in, 301
Cattle, Teat Operations in, 217
Cattle, Trephining in, 321
Cattle, Uterine Prolapse in, 293
Cestodes of the Horse, 376
China, Conditions in, 326
Chloroform Anesthesia, 305
Chondromata in a Dog, 132
Chorea, Treatment of, 529
Clinic, Post Congress, 416
Coccidia Carriers, Bovine, 92
Coccidia of Geese, 44
Coccidiosis of Rabbits, 479
Coccidiosis of Swine, 28
Code, Dog Food, 193
Code, The Serum-Virus, 192
Cod Liver Oil, Vitamins of, 265
Colic, Infection in, 346
Colic, Lang Treatment for, 252
Colic Mixture, 209
Colitis, Treatment for. 67
Collapsed Trachea, 400
Community Sales, 56
Cows, Production of, 229
Cows, Why Culled, 230
Criticism, A Student's, 298
Cyanide Poisoning, 437, 484

D

Dairy Barns, Streptococci in, 384
Dairy Products, Firsts in, 230
Death Penalty and Doctors, 95
Deer, Malignant Edema in, 276
Deer, Strongylosis in, 316
Dental Anesthesia, 514
Dermoid Conjunctival, 256
Diaphragm, Rupture of, 284
Diary, A Professional, 325
Diet and Breeding, 456
Dietary Deficiency, 249
Diphtheroid Angina, 274
Dirofilaria, Treatment of, 234
Discoveries, Bacteriological, Etc., 231
Diseases of the Esophagus, 280
Diseases of the Mouth, 280
Disinfection, Oxidation, 483
Distemper, Blood Changes in, 483
Distemper, Blood Picture in, 266
Distemper, Canine, 116. 136, 247
Docking Prohibited, 449
Dog, A Cross Eyed, 320
Dog Cemetery, 495
Dog, Chondromata in, 132
Dog Feeding, Principles of, 17
Dog Food Advertising, 191
Dog Food Code, 193
Dog Food Industry, 494
Dog Foods, Commercial, 138
Dog Industry, Value of, 101
Dog Foods, Quality of, 495
Dog Publications, 308
Dog, Surgery in, 160
Dog with Lead in Heart, 342
Dogs, Anesthesia in, 535
Dogs, Ascaris Infection in, 93
Dogs, Atresia Ani in, 216
Dogs, Bang Infection in, 45
Dogs, Cauterization in, 478
Dogs, Clinic in, 129
Dogs, Conjunctivitis in, 104
Dogs, Diseases of, 280
Dogs, Distemper in, 116, 136, 247, 266, 344
Dogs, Ear Trimming in, 188
Dogs, Ectropion in, 107
Dogs, Eczema in, 483
Dogs, Enema in, 130
Dogs, Entropion in, 107
Dogs, Esophageal Obstruction in, 198

Dogs, Examination of, 130
Dogs, Eye Diseases in, 104
Dogs, False Pregnancy in, 261
Dogs, Fractures in, 120
Dogs, Fright Disease in, 388
Dogs, Furunculosis in, 259
Dogs, Gastro-Enteritis in, 134
Dogs, Grass Eating in, 264
Dogs, Harder's Gland of, 105
Dogs, Heart Worm in, 234
Dog, Hermaphrodism in the, 65
Dogs, Hysteria in, 534
Dogs, Intestinal Anastomosis in, 160
Dogs, Intestinal Flora of, 223
Dogs, Intestinal Obstruction in, 286
Dogs, Intussusception in, 531
Dogs, Keratitis in, 108
Dogs, Lavage and Gavage in, 438, 480, 536
Dogs, Leucemia in, 302, 303
Dogs, Mange in, 260
Dogs, Mineral Requirements of, 171
Dogs, Nose Prints of, 404
Dogs, Prostatitis in, 257
Dogs, Pyometra in, 532
Dogs, Rabies in, 46, 110, 329
Dogs, Registration of, 114
Dogs, Restraint of, 331
Dogs, Ruptured Diaphragm in, 284
Dogs, Sex Control in, 346
Dogs, Skin Disease in, 477
Dogs, Spaying of, 337
Dogs, Surgery in, 194
Dogs, Tendon Laceration in, 201
Dogs, Trichuriasis in, 216
Dogs, Value of, 101
Doping Race Horses, 271
Dysentery of Swine, 27
Dystocia, Causes of, 515

E

Echinococcus in the Cat, 265
Eczema in the Dog, 483
Eczema in the Horse, 483
Electric Cautery, The, 279, 478
Electrocution of Animals, 458
Elephants, Sick, 173
Encephalitis in Foxes, 344
Endocrine Preparations, 154
Endocrine Therapy, 150
Enteritis, Infect. Necrotic, 27
Enteritis Powder, 254
Erysipelas in Hogs, 26, 466
Esophageal Obstruction, 198
Estrum, Induced, 403
Examination of Urine, 504
Exostoses in the Horse, 264
Extensor Pedis Rupture, 203
Eyeball, Luxation of, 108
Eye, Diseases of, 104
Eye, Enucleation of, 289

F

Farm Income, 229
Fecal Examination, 5, 130
Fees, Veterinary, 62
Fistulous Withers, 521
Foal, Diseases of, 202
Foals, Viability of, 95
Foods, Minerals in, 171
Foot-Rot in Sheep, 314
Foreign Bodies in the Esophagus, 282
Foreign Bodies in the Mouth, 282
Formulae, Useful, 510
Fouadin for Heart Worm, 234
Founder in Cattle, 213
Fowl Leucosis, Antibodies in, 223
Fowl Pox Bodies, 347
Fowl Pox, Course of, 347
Fox, Dental Injuries in, 305
Fox Encephalitis, 344
Foxes, Ascaris Infection in, 93
Foxes, Blood Characteristics of, 497
Foxes, Lungworm in, 12
Foxes, Malignant Edema in, 345
Fractures, Reduction of, 120
France, Vet. Conditions in, 421
Fright Disease in Dogs, 388, 534
Furunculosis in Dogs, 259

G

Garbage Poisoning, 523
Gastro-Enteritis, 134
Geese, Coccidia of, 44
Germ Industry, The, 225
Goats, Calculi in, 279
Goats, Strongylosis in, 316
Goitre in Colts, 204
Growth, Promotion of, 313

H

Harelip, 281
Health Protection, 189
Heart Worm Treatment, 234
Hematuria Vesicalia, 146
Hemorrhagic Septicemia, 25, 470
Hermaphrodism in the Dog, 65
History, Veterinary, 48, 96, 182, 226, 268, 310, 352, 488
Hog Cholera, 519
Hog Cholera Breaks, 81
Hog Cholera Control, 94
Hog Cholera, Immunity to, 301
Hog Cholera Investigation, 313
Hog Cholera Lesions, 170
Hormone Therapy, 2
Hospital Association, 425
Horse, Blood Differentiation in, 47
Horse Breeding, 523
Horse, Exostoses in, 264
Horse Parasite Control, 176
Horses, Amputation in, 256
Horses, Anaphylaxis in, 461
Horses, Blood Sugar in, 301
Horses, Bone Diseases of, 204
Horses Bring Highest Price, 207
Horses, Brucellosis, 483
Horses, Calcium in, 398
Horses, Calculi in, 290
Horses, Catheterization of, 159
Horses, Colic in, 252, 299, 346
Horses, Diseases in, 202
Horses, Doping Race, 271
Horses, Eczema in, 483
Horses, Epizootic of, 68
Horses, Impaction in, 90
Horses, Infectious Anemia of, 91, 221
Horses, Influenza in, 462
Horses, Lameness in, 29
Horses, Lice in, 66
Horses, Narcosis in, 484
Horses, Osteomalacia in, 404
Horses, Parasites in, 68, 376, 443
Horses, Pregnancy Diagnosis in, 402
Horses, Pulling Teams of, 523
Horses, Purpura in, 301
Horses, Rabies in, 175
Horses, Removal of Nasal Septum in, 341
Horses, Sera of, 305
Horses, Shortage of, 493
Horses, Slaughter of, 451
Horses, Tendonitis in, 255
Horses, Tracheal Collapse in, 291, 400
Horses, Tuberculosis in, 91
Hypocalcemia, Treatment of, 430
Hysteria, Canine, 534

I

Impregnation, Artificial, 304, 441
Incubators, Temperature of, 44
Infection and Sterility, 493
Influenza of Horses, 462
Interdigital Abscesses, 315
International Vet'ry Cong., 86, 180, 218, 262, 306
International Vet'ry Cong., I, 89
International Vet'ry Cong., II, 180
International Vet'ry Cong., III, 181
International Vet'ry Cong., IV, 218
International Vet'ry Cong., V, 219
International Vet'ry Cong., VI, 262
International Vet'ry Cong., VII, 263
International Vet'ry Cong., VIII, 306
International Vet'ry Cong., IX, 307
International Vet'ry Cong., XII, 348, 350, 406, 426
International Vet'ry Cong., Achievements of, 355
International Vet'ry Cong., Welcome to, 356, 459, 363, 367
Intestinal Anastomosis, 160, 258
Intestinal Obstruction, 286
Intussusception in a Dog, 531
Intussusception in a Hen, 172
Iodine and Cretinism, 2
Iodine, Discovery of, 1
Iodine for Dams, 95
Iodine not Indicated, 401
Italy, Vet'ry Conditions in, 420

J

Jewish Student Society, 47
Johne's Disease, 9

K

Keratitis in Dogs, 108

L

Lameness in Horses, 29
Laryngo-tracheitis, Status of, 174
Lavage and Gavage in the Dog and Cat, 438, 480, 536
Lead in the Heart, 342
Leucemia in the Dog, 302
Libraries, Cincago Medical, 506
Lice, Pyrethrum for, 66
Location, Choosing a, 60
Lungworm in Foxes, 12
Lupinosis in Chicks, 173

M

Mad Itch, 146
Maggot Therapy, 57, 494
Malignant Edema in Deer, 276
Malignant Edema in Foxes, 345
Man, Anthrax in, 46
Mange in Hogs, 468
Mange Treatment, 260
Mastitis and Milking Machines, 222
Mastitis, How Spread, 495
Mastitis in Cattle, 84, 264
Mastitis in N. Y. Dairies, 527
Mastitis, Streptococci of, 524
Mastitis, Treatment of, 205, 279
Mastitis, Vaccine for, 494
Measles Prophylaxis, 57
Meconium, Retention of, 202
Medicine, Social, 230
Membrana Nictitans, Tumor of, 172
Membrana Nictitans, Wounds of, 106
Mexican Pig, 319
Milk, Allergy Due to, 401
Milk and Public Health, 6
Milk and Tuberculosis, 188
Milk, Constituents of, 314
Milk for Men, 224, 261, 309, 351
Milk, How Consumed, 449
Milk in Daily Diet, 511
Milk in Fatigue, 290
Milking Machines and Mastitis, 222
Milk Inspection, 147
Milk Inspection and Quality, 147
Milk, Pasteurized, 189

Milk, Production of, 56
Milk Therapy, 253, 461
Milk, Vitamin A in, 315
Mineral Requirements, 171
Morphine—Pentobarbital, 535
Mummified Fetus, 172

N

Narcosis in Horses, 484
Nasal Septum, Removal of, 341
Navel Infection, 202
Nematodes of the Horse, 376
Neoplasm in a Horse, 299
Neoplasms of Wild Animals, 502
Nose Prints, 404
Nutritional Ailments, 400
Nymphomania, 403

O

Obstruction of the Esophagus, 282
Ointment Bases, 90
Oothecectomy, 337
Osteomalacia in Foals, 404
Osteomalacia in Horses, 29
Osteoporosis in Horses, 29

P

Paralysis of Cattle, 213
Paralysis of Swine, 445
Parasites of Horses, 68, 176, 443
Parasites of Swine, 90
Parasite Treatment, 258
Parasitisms, Causes of, 147
Paresis of Colts, 204
Patella, Luxation of, 404
Peerless Serum Company, 273
Penis, Amputation of, 256
Plague of Middle Ages, 526
Poacophagia in Dogs, 264
Poisoning, Metalic, 512
Poultry, Blood Samples from, 265
Poultry Brooding Temperatures, 254
Poultry, Capillariasis of, 296
Poultry, Coccidiosis in, 44
Poultry, Disease Carriers in, 496
Poultry, Enteritis in, 254
Poultry Feeds, Vitamins in, 450
Poultry, Intussusception in, 172
Poultry, Laryngo-tracheitis in, 174
Poultry, Leucosis in, 223
Poultry, Loss of, 450
Poultry, Lupinosis in, 173
Poultry, Parasite Control in, 496
Poultry, Pox in, 347
Poultry, Pullorum Types in, 46
Poultry, Range Paralysis in, 222
Poultry, Vitamin E in, 496
Poultry, Worms in, 258
Practice Building, 102
Practice, Building Up a, 62
Practitioner, The Old, 447
Practioner, The Young, 447
Pregnancy, Diagnosis of, 402, 463
Pregnancy Disease of Ewes, 267
Prostatitis, Treatment of, 257
Pruritis in Cattle, 401
Pseudocyesis in the Dog, 261
Public Health and Animal Disease, 76
Public Health Work, 146
Puerperium, Accidents of the, 21
Pulling Contests, 523
Pullorum Disease, 254
Pullorum Disease, Types of, 46
Pullorum, Immunization for, 46
Pulmonary Edema, 26
Purpura Hemorrhagica, 301
Pyelonephritis, 472
Pyometra in Bitches, 532
Pyrethrum for Lice and Ticks, 66

Q

Questions and Answers, 54, 83, 174, 216, 285, 397, 472, 520

R

Rabbit Horns, 486
Rabbits, Coccidiosis of, 479
Rabbits, Paresis in, 403
Rabies, Blood Changes in, 46
Rabies, Eradication of, 329
Rabies in Dogs, 110
Rabies in Horses, 175
Rabies, Lesions of, 484
Rabies, Mass Infection in, 314
Rabies, 72 Exposed to, 1
Rabies, Statistics of, 220
Rabies, Vaccination for, 220
Radio Program, Veterinary, 372
Range Paralysis, Treatment for, 222
Ranula in Dogs, 281
Reading for the Practitioner, 296
Red Cross, The, 498
Reindeer Septicemia, 345
Reproduction in Animals, 493
Restraint of Animals, 331
Reticulo-Endothelial System, 374
Rickets, Historical, 517
Rickets in Colts, 204
Ringworm in Cats, 450
Roumania, Vet' Conditions in, 422
Rumenotomy, 212
Rumenotomy in Cows, 403

S

Sanitation, Achievements of, 231
Scours in Foals, 203
"Seedy Belly" in Swine, 529
Serum Anaphylaxis, 486
Serum-Virus Code, 192
Septicemia of Reindeer, 345
Sex Control in Dogs, 346
Sheep, Abortion in, 395
Sheep, Bloat in, 208
Sheep, Calculi in, 279
Sheep, Calcium Therapy in, 398
Sheep, Cyanide Poisoning in, 484
Sheep, Foot-Rot in, 314
Sheep, Lice and Ticks in, 67
Sheep, Parasiticides for, 497
Sheep, Pregnancy Diagnosis in, 402
Sheep, Pregnancy Disease in, 267
Sheep, Sore Mouth in, 175
Sheep, Strongylosis in, 316
Skin, Self-Disinfection of, 345
Small Animal Practice, 72
Social Medicine, 230
Sodium Hyposulphite in Poisoning, 437
Sodium Iodide, Use of, 257
Sodium Metaphosphate, 23
Sore Mouth in Lambs, 175
Specimens, Mounting, 457
Spermatozoa, Collection of, 304, 441
Spleen, Visualization of, 404
Sterility, Causes of, 493
Stomach Tube Catheter, 513
Stomach Tube, The, 300
Strabismus in the Dog, 320
Strangles, Blood Changes in, 483
Streptococci of Mastitis, 524
Strongylosis of Ruminants, 316
Suipestifer in Man, 146
Sulphur Deficiency, 57
Sulphur, Use of, 260
Surgery in the Dog, 160
Surgery of Small Animals, 194
Surgery, Veterinary, 279
Swamp Fever, Diagnosis of, 91
Swamp Fever in Horses, 221
Sweeny, Prevalence of, 522
Swine, Amebic Dysentery in, 28
Swine, Anaplasmosis of, 288
Swine, Brucellosis in, 92
Swine, Cholera Breaks in, 81
Swine, Cholera in, 94, 301
Swine, Coccidiosis of, 28
Swine Diseases, 24, 464
Swine, Dysentery in, 27
Swine, Erysipelas in, 26, 188
Swine Flu, Discussion of, 225
Swine Flu, Etiology of, 46, 91
Swine Influenza, 26
Swine, Intestinal Anastomosis in, 258
Swine, Kidney Worms in, 451
Swine, Lesions of Cholera in, 170
Swine, Necrotic Enteritis in, 27
Swine, Paralysis of, 445
Swine, Poisoning in, 399, 525
Swine, Pregnancy Diagnosis in, 402
Swine, Pulmonary Edema of, 26
Swine, "Seedy Belly" in, 529
Swine, Stomach Worms in, 90
Swine, Tuberculosis in, 347

T

Tapping a Cow, 211
Taxes, Reduction of, 186
Teat Operations, 217
Teeth, Constituents of, 346
Tendonitis in Horses, 255
Testicular Therapy, 403
Tetany, Lactation, 394
Thymus Gland Extracts, 313
Ticks, Pyrethrum for, 66
Tracheal Rings, Collapse of, 291
Trichinosis, Allergy in, 45
Trichinosis Infestation, 444
Trichomonad Abortion, 44
Trichuriasis in a Puppy, 216
Tuberculosis and Milk, 188
Tuberculosis, Avian, 450
Tuberculosis, Cost of, 186
Tuberculosis, Diagnosis of, 91
Tuberculosis Eradication, 499
Tuberculosis of Pigs, 347

U

Udder, Ablation of, 339
Undulant Fever, 264
Undulant Fever, Changes in, 223
Urachus, Persistent, 203
Urethral Calculi, 279, 519
Urinary Calculi, 214, 290
Urine Examination, 504
Uterus, Prolapse of, 293

V

Vaccine for Blackhead, 2
Vaccine for Mastitis, 229
Vaccine for Psittacosis, 313
Vaginitis, Trichomonad, 44
Veterinarian and Public Health, 53
Veterinarian, Brucella Allergy in, 45
Veterinarians in Public Health Work, 146
Veterinarians' Portraits Lost, 272
Veterinary Achievements, 58, 411, 415
Veterinary Cleaning Agent, 23
Vet' Conditions in Belgium, 420
Vet' Conditions in France, 421
Vet' Conditions in Italy, 420
Vet' Conditions in Roumania, 422
Veterinary Conventions, 500
Veterinary Exhibit, 190
Veterinary Fees, 62
Veterinary History, 48, 96, 182, 226, 268, 310, 352, 488
Veterinary Magazines, 424
Veterinary Openings, 315
Veterinary Police Measures, 56, 148
Veterinary Service, 232
Veterinary Service, Promoting, 272
Veterinary Society, Jewish, 47
Virus Infections, Portal of, 5
Vitamin A in Milk, 315
Vitamin D in Foods, 449
Vitamin D Milk, 501

W

Warts in the Mouth, 281
Wild Life Disease, 485
Women Veterinarians, 271, 418
Words Often Mispronounced, 94

INTERNATIONAL LIVE STOCK EXPOSITION TO OPEN IN NEW QUARTERS

With the approach of the closing date for filing entries in the 1934 International Live Stock Exposition, to be held in its new and greater home at the Chicago Stock Yards December 1 to 8, the management announces that the largest entry of live stock in the history of the Exposition has been received.

This year is the 35th anniversary of this largest of the continent's live stock shows, held annually since its inception during the week following Thanksgiving.

Entries, for the most part, include prize herds and flocks, draft horses, and fancy riding and driving horses and ponies that have won ribbons high on the prize lists of state and provincial fairs and sectional expositions held during recent months throughout this country and Canada.

The International Exposition provides the finals of the American live stock show season, and winners at the Chicago show are recognized as the continental champions of the year.

An elaborate dedication ceremony is planned for the opening day of the 1934 Exposition for the new buildings that have been constructed throughout the extensive area of the Chicago Stock Yards that were leveled in the great fire on May 19th last. Largest of the new structures is the International amphitheatre, declared to the finest building in the world devoted to the exhibiting of live stock.

All of the railroads entering Chicago have indicated that special low round-trip fares will be granted from points along their lines to Chicago for this outstanding event on the 1934 agricultural show season's calendar.

UNITED STATES CIVIL SERVICE EXAMINATION

Junior Parasitologist

Applications for the position of Junior Parasitologist, Bureau of Animal Industry, Department of Agriculture, must be on file with the U. S. Civil Service Commission at Washington, D. C., not later than November 26, 1934.

At present there is a vacancy in the Bureau of Animal Industry with headquarters at Beltsville, Md. The Department of Agriculture wishes to fill this position with a woman eligible. Both men and women, who are qualified, will be admitted to the examination.

The entrance salary is $2,000 a year, subject to a deduction of not to exceed 5 per cent during the fiscal year ending June 30, 1935, as a measure of economy, and also to a deduction of 3½ per cent toward a retirement annuity.

The duties are to conduct research in the field of animal parasitology, including such routine assignments as the identification of parasites, the examination of animals for parasites, and similar work.

Full information may be obtained from the Secretary of the United States Civil Service Board of Examiners at the post office or customhouse in any city which has a post office of the first or the second class, or from the United States Civil Service Commission, Washington, D. C.

WORLD CHAMPIONSHIP PULLING CONTEST

The Statler Farms Co., Piqua, Ohio, who have held the world's championship for the last year with Rock and Tom, successfully defended their title at the Century of Progress World Championship Pulling Contest, Aug. 18, 1934, by winning first over all in the contest. The winning horses are grade Belgians and the pair weighed 4,350 pounds.

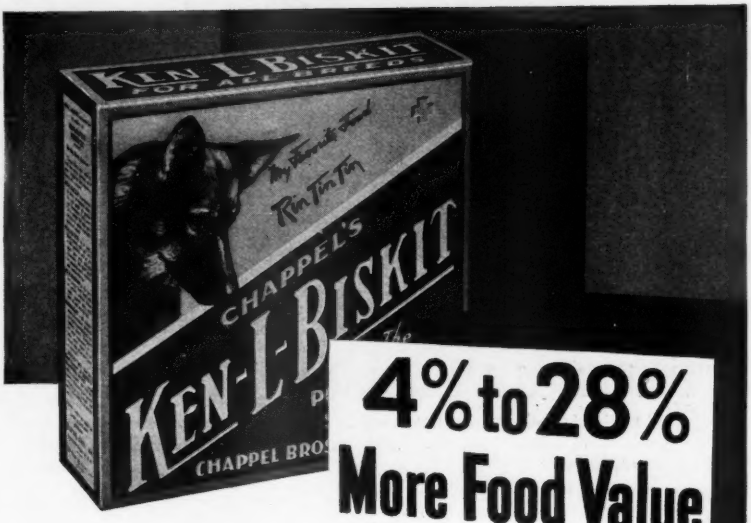
Their winning pull was when hitched to a tractive resistance of 3,350 pounds, which would be equivalent to starting 15 to 20 times, a load of 42,800 pounds on a wagon on granite block pavement. Immediately thereafter, in an exhibition pull for the photographers, they drew the dynamometer the full distance (27½ feet) at a tractive resistance of 3,400 pounds, equivalent to starting, 15 to 20 times, a load of 43,580 pounds on a wagon on granite block pavement.

The second prize pair, Bob and Frank, owned by George Manley, of Shreve, Ohio, were the lightest of the pairs entered in the finals. They weighed 3,570 pounds, but were thick, compact, powerfully made horses, with more heart girth than many horses of greater weight. Frank in particular excelled in this, for while he weighed only 1,740 pounds, he had a heart girth of 91 inches, being excelled in this by only three horses out of the entire 38,—much heavier horses—and equalled by only three others. Bob, his mate, measured 87 inches heart girth, also a high rating for his size.

Homer Crawford, of Potomac, Illinois, was third with Rock and Fred, a bay and a chestnut, weighing 3,920 pounds. This pair pulled together in splendid shape in virtually every trial, but could not make enough distance at the finish to defeat the Manley team.

First prize was $500, second prize $200, third to tenth prizes, were $100 each. In addition each of the owners received a certificate of award, and Century of Progress medals, appropriately mounted as watch fobs, were awarded to the drivers of each of the winning teams. First prize was a gold medal, which was awarded to Russell Sando, who drove the Statler team; the second, a silver medal, was awarded to George Manley, who drove his own team; third, a gold-bronze medal, was awarded to Homer Crawford, who also drove his own team; all other winning drivers were awarded bronze medals, appropriately engraved for the occasion.

An enormous crowd attended both the elimination contests on Friday and the finals on Saturday and every good pull was rewarded with tremendous applause. The judges were H. F. Moxley of the Michigan State College, Harry D. Linn of the Iowa Horse and Mule Breeders Association, and C. W. Crawford, of the Illinois State Experiment Station. Wayne Dinsmore, Secretary of the Horse and Mule Association of America, was in charge of the contest for the Century of Progress.



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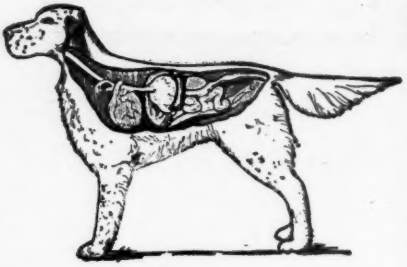

From experiments on living animals have come two sensational discoveries—bearing the highest commendation and solving two problems that have long vexed those who feed dogs. Announcement of these last month found veterinarians alive to the importance and eager to try the Food that contained them.

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VIRGINIA COMPLETES STATE-WIDE TUBERCULIN TESTING OF CATTLE

Virginia is now practically free of cattle tuberculosis, the U. S. Department of Agriculture announces. The Bureau of Animal Industry, as of Nov. 1, recognizes the state as a modified accredited area. Virginia is the fourth state on the Atlantic Coast to be recognized as a statewide modified accredited area. Oregon on the Pacific Coast, was similarly accredited the same day, bringing to 17 the total of accredited states.

After the so-called area plan was taken up, the volume of tuberculin testing of cattle in Virginia increased greatly and for the last six years an average of about 160,000 tuberculin tests were applied in the state annually.

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The Cedar Rapids (Iowa) Gazette has carried two feature stories in recent issues, dealing with veterinary medicine, one discussing the service of the veterinary profession in public health matters and the other, city milk inspection in Cedar Rapids as conducted by Dr. A. R. Menary. In the former article, the Eastern Iowa Veterinary Association comes in for much commendatory mention.

The Illinois Experiment Station recently issued Circular No. 424, entitled "The Farm Horse." It is clear, concise, well illustrated with photographs of the best type of Percheron, Belgian, Shire and Clydesdale horses, and has complete directions for their practical care, feed and management. The Horse and Mule Association of America rates this Illinois bulletin as one of the best issued in years on horses.

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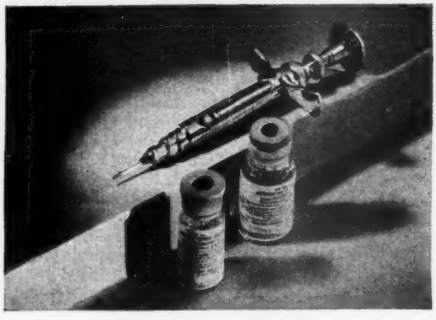

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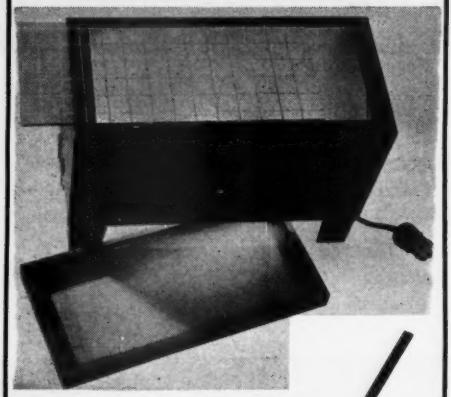

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WANTED: Experienced laboratory man by a commercial concern. Some business training would be an advantage. Address: No. 119, care of VETERINARY MEDICINE.

Nineteen Lexington County and Fayette County (Kentucky) veterinarians met in Lexington recently and organized the Central Kentucky Veterinary Medical Association. John Hagyard was elected president; W. E. Coover, vice president and A. J. Steiner, secretary-Treasurer. The organization received a complimentary write up in The Lexington Herald.

ARMY VETERINARY SERVICE

Captain Harry R. Leighton, now on temporary duty in Seattle, Wash., is relieved from further assignment and duty at Fort Lewis, Wash., and will report to the commanding officer Seattle quartermaster depot for duty.

The promotion of 1st Lieut. Charles S. Greer to the grade of captain, with rank from October 10, 1934, is announced.

Major James E. Noonan is relieved from duty at San Francisco port of embarkation, Fort Mason, Calif., effective at such time as will enable him to proceed to San Francisco, Calif., and sail on transport scheduled to leave that port on or about January 4, 1935, for the Philippine Department.

Major Will C. Griffin is assigned to duty at the Army Medical Center, Washington, D. C., effective upon completion of his present tour of foreign service in the Philippine Department.

The promotion of 1st Lieut. John L. Owens to the grade of captain, with rank from October 29, 1934, is announced.

Veterinary Reserve Corps

New acceptances: Brown, Douglas Robert, 2nd Lt., 105 S. McKinny, Ennis, Texas. Schrumpf, Henry Russell, 2nd Lt., 342 S. W. First St., Richmond, Ind.

Promotions: Moe, Lewis H. to: Capt., 711 Jefferson, Stillwater, Okla.

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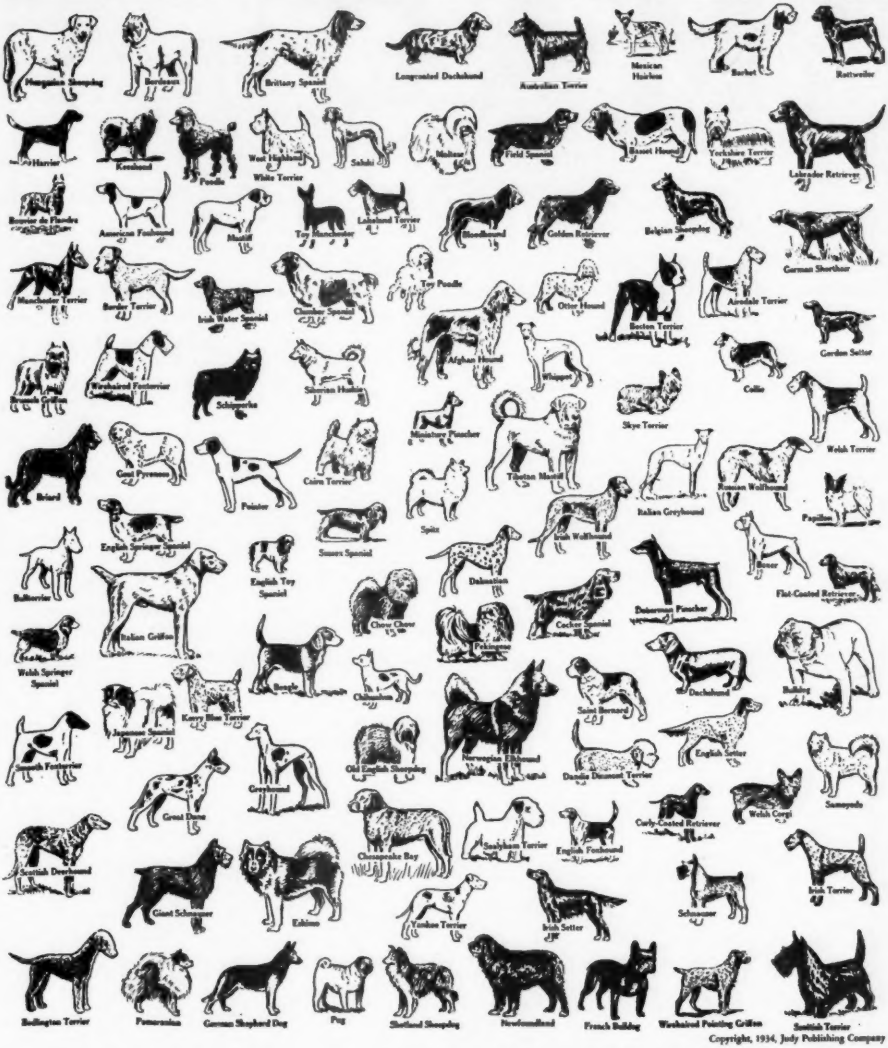
Picture Chart of All Breeds



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This chart, 19x24 inches in size, arranged with colored border, is suitable for framing for the office wall or for use as received. The American Kennel Club recognizes officially for show and registration purposes, 96 breeds of dogs. All these and 10 other breeds are shown in this chart. The names and spelling on this chart are according to official listing. The illustrations are drawn from the official standard of perfection for each breed. It is the answer to the oft repeated question: "Doctor, what breed is he?" "There are the standards for all breeds; pick it out." The chart is highly useful, informative and authoritative.

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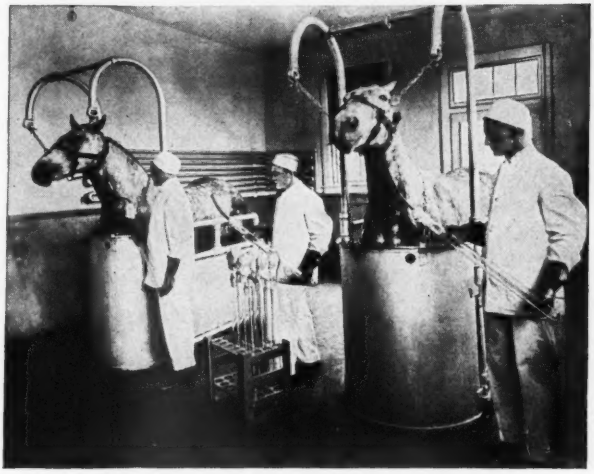

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